

REPORT
OF THE
DEPARTMENT OF AGRICULTURE
1958



SIERRA LEONE GOVERNMENT

Price—**FOUR SHILLINGS**

FREETOWN:

PRINTED AND PUBLISHED BY THE GOVERNMENT PRINTING DEPARTMENT, SIERRA LEONE

TABLE OF CONTENTS

	<i>Pages</i>
PART I—POLICY AND GENERAL REVIEW	
<i>A</i> —THE PROVISION OF ADEQUATE FOOD FOR THE POPULATION	4-5
<i>B</i> —THE CULTIVATION OF CASH AND EXPORT CROPS ..	6-7
<i>C</i> —SOIL CONSERVATION.. .. .	8
<i>D</i> —THE QUALITY OF AGRICULTURAL PRODUCE	8
<i>E</i> —STAFF TRAINING AND AGRICULTURAL EDUCATION ..	8-9
<i>F</i> —RESEARCH	9
<i>G</i> —GENERAL	9-10
PART II—THE WORK OF THE DEPARTMENT OF AGRICULTURE	
<i>A</i> —ORGANISATION AND STAFF	10-11
<i>B</i> —AGRICULTURAL STATIONS	11-14
<i>C</i> —HORTICULTURAL SECTION	14-16
<i>D</i> —WATER CONTROL SECTION	16-17
<i>E</i> —EXTENSION WORK	18-27
<i>F</i> —RESEARCH:	
Plant Pathology Section.. .. .	27
Systematic Botany Section	28
Entomology Section	28
Agricultural Chemistry Section	29
Soil Survey Section	30
<i>G</i> —NJALA TRAINING COLLEGE	30-31
APPENDICES	
<i>I</i> —EXPORTS OF PRINCIPAL AGRICULTURAL PRODUCTS ..	32
<i>II</i> —RAINFALL	33
<i>III</i> —RESULTS OF TRIALS AND EXPERIMENTS, NJALA ..	34-36
<i>IV</i> —RESULTS OF BLACK POD SPRAYING TRIALS, KPUABU ..	37-38
<i>V</i> —LOCAL WEIGHTS AND MEASURES	38-39



Digitized by the Internet Archive
in 2025

SENIOR STAFF AT 31st DECEMBER, 1958

DIRECTOR:

J. W. D. Goodban, O.B.E., M.A., Dip. Agric. (Cantab.), A.I.C.T.A.

DEPUTY DIRECTOR:

T. S. Jones, O.B.E., B.Sc. (Agric.), M.Sc. (Reading), A.I.C.T.A., F.L.S.

PRINCIPAL AGRICULTURAL OFFICER:

E. H. Nichols, B.Sc. (Agric.) (Dun.), Dip. Agric. (Cantab.), A.I.C.T.A.

SECRETARY:

C. A. Gabbidon

DEPARTMENTAL SPECIALIST OFFICERS:

Plant Pathologist:

C. T. Pyne, B.Sc. (Hons.) (Wales), M.Sc. (Notts.), Dip. Agric. sci. (Cantab.).

Agricultural Chemist:

C. J. Piggott, B.Sc. (Agric.) (Reading), Dip. Agric. sci. (Cantab.), D.T.A. (Trinidad).

Horticulturist:

H. D. Tindall, M.Sc. (Hort.) (Reading), N.D.H., A.I.P.A.

Agricultural Engineer:

R. A. Stewart, G.I. Mech.E.

Chemist (Soil Surveyor):

A. R. Stobbs, B.Sc. (Hons.) (Dun.), F.R.G.S.

RICE RESEARCH STATION SPECIALIST OFFICERS:

Officer-in-Charge:

H. D. Jordan, B.Sc. (Hons.) (Lond.), A.R.C.S., A.I.C.T.A.

Botanists:

E. H. Roberts, B.Sc., Ph.D. (Manchester).

R. Q. Craufurd, B.Sc. (Hons.) (Wales).

A. J. Carpenter, B.A., Dip. Agric. sci. (Cantab.).

Soil Chemists:

P. R. Hesse, B.Sc. (Hons.), Ph.D. (Lond.), F.R.I.C.

M. G. R. Hart, B.Sc. (Hons.) (Notts.), Ph.D. (Lond.).

J. W. O. Jeffery, B.Sc. (Lond.).

WATER CONTROL BRANCH OFFICERS:

Irrigation and Drainage Engineer:

D. S. Garvie, B.Sc. (Civil Eng.) (Aberdeen), A.M.I.C.E.

Superintendent of Works:

T. A. Maton.

FIELD OFFICERS:

Senior Agricultural Officers:

J. M. Dent, B.Sc. (St. Andrews), A.I.C.T.A.

J. A. C. Davies, B.Sc. (Agric.) (Reading).

R. S. Liney, B.Sc. (Agric.) (Leeds).

Agricultural Officers:

- D. O. Williams, B.Sc. (Agric.) (Edin.), Dip. Agric. (Cantab.), D.T.A. (Trinidad).
 A. K. Murray, M.A., Dip. Agric. (Cantab.).
 C. R. Dunton, B.Sc. (Agric.) (Leeds), Dip. Agric. (Cantab.), D.T.A. (Trinidad).
 W. Macnab, N.D.A., N.D.D., C.D.A., C.D.D.
 R. F. A. Murfitt, B.Sc. (Hons.) (Lond.), D.T.A. (Trinidad).
 B. R. Shaw, B.Sc. (Agric.) (Leeds), D.T.A. (Trinidad).
 H. E. G. Morgan, B.Sc. (Hons.) (Wales), D.T.A. (Trinidad).
 R. L. Morris, B.Sc. (Hort.) (Notts.), D.T.A. (Trinidad).
 R. C. Knill, B.Sc. (Birmingham), D.T.A. (Trinidad).
 R. I. McQuistan, B.Sc. (Agric.) (Aberdeen), D.T.A. (Trinidad).
 J. M. Oliphant, B.A. (Agric.) (Oxon).
 J. P. Law, B.Sc. (Agric.) (U.B.C.), D.T.A. (Trinidad).
 S. A. Kawa, B.Sc. (Agric.) (Wye.).

Agricultural Superintendents:

- A. S. Kerton.
 J. P. Hopkins.
 W. E. A. French, C.D.A.
 J. O. P. Davies, C.D.A.
 A. R. Siaffa, B.Sc. (Agric.) (Wales), Dip. Agric. (Reading).
 W. J. Aboko-Cole.
 N. A. Taylor, C.D.A.

Agricultural Superintendents (Mechanical):

- J. J. F. Glass, M.I.B.A.E.

Temporary Agricultural Superintendents: (Agricultural and Mechanical):

- J. C. Rippey, B. Agric. (Belfast).
 D. J. Watson, C.D.A.
 C. R. Elliott.
 J. H. Kearns.
 J. U. Wright, B.S. (Florida), M.S. (Michigan).
 R. G. Routley.
 L. W. Dale.
 J. B. Whitting, N.D.A., C.D.A.
 C. W. Oliver, N.D.A., C.D.A.

REPORT OF THE DEPARTMENT OF AGRICULTURE FOR THE YEAR 1958

PART I—POLICY AND GENERAL REVIEW

The overall general policy remains unchanged and can be readily summarised as follows:—

“ to ensure the best land use, by conserving the productivity and fertility of the soil, and to encourage a balanced production of food and cash crops and livestock, with surpluses for export, to the best advantage of the community ”.

2. However, within this broad policy definition, this year there have been two particularly important and significant changes. The first of these has concerned an open invitation from the Government welcoming the establishment of plantation enterprise; and the second, for the existing rice mechanical cultivation scheme, has initiated a change over in the payment of ploughing fees by farmers in arrears to a system of payment in advance.

3. Whilst in the early 1900's there were a few isolated and incomplete attempts to establish plantations in Sierra Leone, the Government has for many years now directed all its own efforts towards improving small farmer production. This pattern of development has been changing in Ghana and Nigeria, where, more recently, plantations are being established by outside agencies, the Colonial Development Corporation, and Regional Production Boards. The Sierra Leone Government has also now accepted the principle that such development can bring many advantages both to the country's economy and to the small farmer, particularly through the provision of marketing and processing facilities, as well as by assisting in production expansion.

4. As a result, besides the Government statement welcoming potential plantation development in Sierra Leone, the Director accompanied the Ministers of Trade and Industry and Works and Housing on a visit to Messrs. Firestones' rubber plantation in Liberia in August, and departmental staff undertook a series of field reconnaissances in order to select a number of potential areas suitable for rubber and oil palm plantation development.

5. In November these sites were visited and inspected by representatives of Messrs. Pamol (Unilever) and the Colonial Development Corporation.

6. Meanwhile the Agricultural Department was itself given authority to start nurseries for the establishment of two one-thousand acre oil palm plantations around the Produce Marketing Board's pioneer oil mills at Kangha and Sahn in the South-western District.

7. The Department also introduced improved high yielding rubber planting material from Messrs. Firestones in Liberia and established a small nursery at Njala.

8. Negotiations were also started between the Sierra Leone Government and the Aureol Tobacco Company, which proposes to establish a cigarette factory near Freetown and to carry out trials, initially in the Makeni area, for the local production of leaf tobacco, which will be produced by farmers for purchase by the Company.

9. Once again interest has also been re-awakened in the possibilities of banana production on a plantation scale with preliminary inquiries, to be followed in 1959 by field survey, from joint banana concerns.

10. Whilst all these developments are as yet still very much in the survey and negotiation stage, and therefore perforce are not likely to make an immediate impact on the country, or the farming community, it is of particular significance that they have been initiated, and it is of vital importance that their true and potential worth should be properly appreciated by all concerned.

11. There are reasonable grounds for confidence that certain plantation crops will do well in Sierra Leone, provided they can be grown where conditions are most suitable. Unfortunately accurate yield data and establishment costings of high yielding improved types, particularly of rubber and oil palms, are not yet locally available. However the main factors, which are likely to be of importance if plantations are to be established as successfully as in other territories, are the availability of suitable land with reasonable communications and the cost of labour.

12. The second major change in policy concerned the mechanical cultivation scheme for rice which has been built up by the Department over the last eight years. From its inception it had been policy to accept payment at the succeeding harvest for ploughing and harrowing carried out for farmers. Not unnaturally, as in other countries where this was initially similar practice, a backlog of arrears built up which became both difficult to collect and too onerous to continue financially.

13. It was also ethically encouraging a poor sense of responsibility amongst producers, and it was therefore decided that for the 1957/58 season 10s. of the £3 ploughing and harrowing charge per acre should be paid in advance; and that in 1958/59 the full payment would be required before any ploughing was done.

14. This, not surprisingly, has resulted in an all round reduction of the acreages ploughed and harrowed, although in the Bonthe grasslands, where the farming community has particularly benefitted from this scheme, the fall has been far less marked than elsewhere. In such areas where yields of 30 bushels of paddy per acre are obtainable, worth £30, it is not unreasonable to be expected to pay a fee for preliminary cultivations of only £3, particularly as this is itself a subsidised charge.

15. There are indications however that those farmers, who have stood out against payment in advance, are now realising this and that acreages will once again begin to climb back to the 12,000 per season which has been set as the Department's overall programme.

16. At the same time, because of consolidation, the Co-operative Department has not expanded the acreage ploughed and harrowed through their producer societies.

17. The comparatively high overall costs of rice production, marketing and milling were the subject of some comment in the Economic Survey Report produced for the Government during the year by Professor T. D. Jack of Durham University. In other respects, in that it made few suggestions for potential agricultural development, this report could be said to be disappointing.

18. It is to be regretted also that the publication of the draft White Paper on Agricultural policy, which was under preparation in 1957, has had to be temporarily shelved because of the need for overall financial restrictions.

19. Yet whilst the country's economy was itself suffering a recession, there were signs towards the year's end that an improving trend in the volume of agricultural exports was becoming apparent.

20. Diamond mining continued to attract many younger men, but some have begun to return to agriculture, perhaps disillusioned at not having been able to get rich quickly, and the figures for palm kernel exports have risen slightly, after several years of serious decline.

21. Yet in spite of a smaller non-farming population in the minefields, rice imports, which might have been expected to fall, again increased. Whilst some rice may have found its way to French Guinea, it is certain that generally overall living standards have improved and more rice is now being consumed individually.

22. The table of export crop tonnages and values shown in Appendix I, does not in fact always represent a true picture of the crop year, being compiled as it is for a calendar year. This particularly applies to cocoa, which may be late to ripen, or be delayed in shipment; for example this year the calendar year export figures show an increase of 800 tons over 1957, whereas crop seasonal purchases were actually only some 50 tons up, being 2,540 tons in 1958/59 compared to 2,493 in 1957/58; of this however 99 per cent was first grade compared to 93 per cent in the previous season.

23. Cocoa production is continuing to increase gradually, with a more lively interest being revived particularly because of the experimental work now being undertaken by the Department on the new station recently established at Kpuabu in Kenema district with the assistance of a Colonial Development and Welfare grant.

24. It was a less satisfactory crop season for coffee and exports fell slightly in consequence, although the overall trend is likely to be towards very considerable production increases over the next few years as all the new plantings come into bearing.

25. There were indications that world prices which had been high were beginning to fall seriously by the end of the year and there is no doubt that Sierra Leone will have to be careful to acquire more efficient production standards, and better quality of export produce, if it is to continue to find worthwhile markets, with world over production in sight. In 1958 two-thirds of the exports were to the United States of America, which may, if it takes more coffee from Brazil, become a less easy market.

26. For both coffee and cocoa it is plain that farmers generally require to take a more detailed interest in individual tree performances; all too often farms consist of only a very small proportion of trees really in good bearing, and the remainder are useless passengers, which should be replaced by better trees, or not have time and energy wasted upon their maintenance.

27. Ginger prices again fell, as did those for piassava, and both these products are suffering from lower world demand, although the production of the latter, which is regularly undertaken to provide cash for essentials over and above food production, kernel collection and fishing in the Bonthe and Pujehun swamp areas, was maintained nonetheless.

28. A significant development has been the greatly increased demand, particularly in the Colony area, for poultry breeding stock, where numerous small holders, taking advantage of the department's advisory service, are developing a worthwhile industry for supplying the Freetown demand.

29. There is no doubt that both for poultry and pig production there is, in this area, an excellent livelihood for anyone who is willing to organise and maintain breeding stock according to accepted principles.

30. Amongst many visitors whom it was a pleasure to welcome during the year, it was especially so to have a two-week visit from Mr. G. M. Roddan C.M.G., Deputy Agricultural Adviser to the Secretary of State, who started his career in Sierra Leone from 1930 to 1942. His comments and comparisons were naturally of particular interest and value therefore.

A—THE PROVISION OF ADEQUATE FOOD FOR THE POPULATION

31. *Rice*.—Visitors to Sierra Leone are always surprised to learn that rice is the principal staple food of one and all and that the other grain crops, which are more popular elsewhere in West Africa, are of so little importance. It is not easy to explain why this should be, except that because of the abundance of swamps and wild rice, followed by the introduction of new varieties by the early Colonists, it has been so from time immemorial. More recently, departmental introductions of deep flooding varieties from Indo China, the increasingly important work of the Rice Research Station at Rokupr, and the departmental mechanised cultivation scheme have all played important parts towards improving yields and methods of production, together with the increased utilisation of hitherto unproductive swamps.

32. Yet, as has been plainly apparent over the last few years, because of improving standards of living and the drift of young farmers away to diamond mining, and, in spite of all the Government's efforts to encourage increased production, a large annual import has been necessary.

33. In 1958 this totalled 20,669 tons, an encouraging drop of over 10,000 tons compared to 1957, but one which is unlikely to be repeated in 1959, because of the poor upland crops harvested this season.

34. Whilst an accurate assessment of the total crop is at present impossible, departmental estimates indicate that the probable acreage yields for local production, plus import, represent a consumption per head of population of some $\frac{1}{2}$ lb. of rice per day; and it remains a sobering thought that it would require the production from at least a further 62,000 acres to offset an annual import of 30,000 tons of milled rice.

35. Reference has already been made to the effect which the change of policy for payment of ploughing fees has initially had by leading to reduced acreages cultivated under the departmental mechanised scheme. It is anticipated that this trend will continue for another year until the complete change over to advance payments has been effected, but that thereafter acreages will again recover.

36. The acreages ploughed in this departmental scheme since its inception according to circles are shown below:—

District	Acres Ploughed									
	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Southern Circle	4	69	282	465	1,178	2,278	4,073	5,530	5,302	4,346
North-western Circle ..	—	—	80	645	683	757	1,014	2,008	2,334	320
South-western Circle ..	—	—	32	719	1,018	1,012	1,173	1,484	1,606	1,015
Northern Circle ..	—	—	—	238	915	2,449	3,600	2,819	2,625	1,504
North-eastern Circle ..	—	—	—	30	163	127	141	250	160	206
Colony ..	—	—	—	—	—	4	65			
Total ..	4	69	394	2,097	3,957	6,627	10,066	12,091	12,027	7,435

37. The Rice Co-operative producer societies additionally ploughed 3,400 acres for their members at three centres; compared to 3,600 acres ploughed and allocated by them in 1957. Co-operative marketing societies also assisted members with loan advances to cover prepayment of ploughing fees for the Agricultural Department's scheme.

38. The Water Development Branch of the Department, established with the assistance of a Colonial Development and Welfare grant, began operations for the reclamation of 5,000 acres in the Funkedeh and Yakban areas of the Great Scarcies early in April. After preliminary survey, five Priestman dragline excavators commenced the opening up of free flow drainage channels, which will rapidly enable farmers to cultivate hitherto unproductive land for rice. A central base for this unit has been established at Makot.

39. Whilst no other new District Council swamp clearance schemes were initiated, and generally the cultivation of areas more recently opened up under mangrove clearance schemes was less popular, the overall extension of inland swamp utilisation continues to be evident; and it remains a major item of departmental policy to encourage this in contrast to the use of the less fertile and more easily eroded uplands.

40. The sale of superphosphate fertiliser was again subsidised by Government, and continued to be fairly popular particularly in the inland areas, totalling 137 tons.

41. Marketing and milling problems continued to be acute, although the Department of Commerce and Industry has now had plans approved for the erection of new mills both at Kissy in Freetown and at Torma Bum in Bonthe District. The installation of additional drying and parboiling equipment in Freetown should also help in allowing a speeding up of the utilisation of the large stocks of local rice still held and awaiting milling.

42. At the year's end, and for the first time, the Advisory Committee on West African Rice Research met at Rokupr, with representatives attending from Nigeria and Ghana as well as from Sierra Leone. This Research Station's annual report is now published separately.

43. *Other Food Crops.*—Cassava remains the second most important staple food crop, and is grown throughout the country on a considerable scale. Three new mosaic resistant varieties have been introduced from Nigeria for trial. Sweet potatoes and groundnuts were all grown in some quantity for local consumption and vegetable production continues to expand around urban centres and in the Kabala area, although onions continue to be a big and increasing import totalling nearly 4,000 tons worth £121,159, mostly from Egypt and the Netherlands.

44. *Livestock: Cattle.*—The Veterinary Department's report states that over the last decade cattle numbers have multiplied exceedingly, especially in the Northern Province. It is unfortunately impossible to assess accurately both the large numbers which come in from French Guinea for slaughter or the proportion which are from local herds, but the Medical Department records of slaughter house butchering figures give 3,873 for Freetown and Rural Areas, 1,404 for Bo, and 1,115 for Kono as the three main centres. Yet when the value of processed meat imports for the year are also considered, totalling some £167,000 compared to £209,000 in 1957 it is evident overall both that comparatively little meat is eaten, and that either because of over stocking or more probably because of the smaller numbers of people in the minefields even this demand has fallen; (on the other hand however fish and fish products are obviously in very much greater demand than meat for the diet).

45. Nonetheless there can always be a very worthwhile trade for cattle production locally provided marketing and distribution problems can be resolved.

46. At Musaia, long-term selection and breeding work aimed to obtain an early maturing beef strain of Ndama cattle continues on the department's Animal Husbandry Station, where pasture improvement is also being investigated. Helminthiasis has proved a problem amongst both cattle and sheep.

47. In the same area the Cattle Owner Settlement Scheme has continued to progress with 86 holdings occupied, 124 surveyed and 110 registered, an extension having now been started in Kuranko territory, additional to those existing in the Yalunka area. 'Farming areas' have also been declared into which cattle are not allowed to trespass. A problem is arising on some settlement holdings from excessive bush regrowth on previously overstocked and eroded areas, with a consequent lack of grazing potential.

48. *Pigs*.—Newton and Njala are the two main breeding stations supplying producers particularly in the Colony and Bo areas. At Newton, unfortunately, disease troubles continued to puzzle the Veterinary Department, and there were eighteen deaths, of which at least six were due to trypanosomiasis; effective protection by inoculations using Antrycide Suramin complex now appears to be possible, however.

49. *Poultry*.—The demand for poultry continues to increase, and it is proving more and more difficult to keep pace with this under existing facilities. Newton alone supplied 3,725 day-old chicks and 3,805 at 6-8 weeks to breeders, with overall sales being doubled. Egg production was also a record 89,259 being laid, of which 23,239 were incubated, and 1,452 sold for hatching. Hatchability figures improved to 76.8 per cent and the level of rearability to 8 weeks maintained at 78.6 per cent.

50. Imported stock of Aylesbury and Khaki Campbell ducks are now being tried and promise well; a record number of ducks have also been sold for breeding.

51. It is of interest also that the value of egg imports has risen rapidly from £4,623 in 1954 to £31,883 this year.

B—THE CULTIVATION OF CASH AND EXPORT CROPS

52. *Cocoa*.—It has already been explained in paragraph 22 that the seasonal purchases were this year increased slightly by 50 tons totalling 2,540 compared to 2,493 in 1957/58; 99 per cent of this being Grade I.

53. During a visit by an officer from the West African Cocoa Research Institute, Ghana, in April the existence of a virus disease on a farm at Gandorhun, in Jaluahun Chieftdom of Kailahun District was discovered. This is the first record in Sierra Leone of such a disease, which is probably allied to 'Swollen Shoot', which has caused untold damage to cocoa plantations in Ghana and elsewhere.

54. In consequence of this discovery, departmental staff were sent to Ghana to learn the survey and control methods being used there for Swollen Shoot, and plans and estimates were drawn up based on these for the initiation of surveys throughout the Sierra Leone cocoa area.

55. In December, Government decided that the proposal to carry out an immediate quick reconnaissance survey should be put in hand, and that for a semi intensive and more detailed follow up survey thereafter was also accepted in principle.

56. Funds for the reconnaissance survey are being provided by the Produce Marketing Board, and a Cocoa Virus Survey Officer, to lead the field inspection teams, is now being recruited.

57. Decisions as to the ultimate policy to be applied as to controlling the disease have been deferred meanwhile until both the nature of this type of virus has been more definitely determined and until the reconnaissance survey can have indicated the amount and distribution of the disease likely to be occurring.

58. Meanwhile the establishment of the new departmental Cocoa and Coffee Station at Kpuabu south of Kenema has continued, with the erection of buildings and the establishment of further trial plots including more Amazonian varieties received from the West African Cocoa Research Institute.

59. At Kpuabu also, the Plant Pathologist's spraying trials on Black Pod, *Phytophthora palmivora* Butler, have been remarkably successful and it is now proposed to begin applying next year a Carbide Bordeaux spray programme to farmers cocoa through their own Co-operative Societies in three nearby village areas.

60. Additionally with an Entomologist likely to be appointed in 1959, it is also hoped that experimental work into the control of capsid damage can be initiated.

61. Plans are also in view to revive organised monkey drives, because of the serious damage caused by these pests.

62. If all these problems can be practically and satisfactorily resolved there should be an immediate and very considerable increase in cocoa production. While Sierra Leone's exports of this commodity are comparatively small, this crop is the source of a sizeable income to the farmers of the South-eastern region, and there must be quite a number who individually receive well over a £100 in good years from this crop alone.

63. The Produce Marketing Board continued to offer the same grade prices as in previous years, viz:—£186 13s. 4d. per ton, Grade I, £168 Grade II and £130 13s. 4d., Grade III. More favourable world prices enabled the Board to more than recoup the loss of £64,696 sustained in subsidising these prices in 1957. With 99 per cent of the crop graded as top quality, it can truly be claimed that all departments, Co-operatives and farmers concerned with the production of this crop have achieved remarkable success.

64. *Coffee*.—Owing to world overproduction of robusta type coffees, prices were expected to fall in 1959; but although the crop in 1958 was below that for the previous year, 3,347 tons compared to 3,758, more favourable prices earlier resulted in the export value remaining at the same level.

65. In spite of the uncertain future, particularly with a large proportion of exports going to the United States, plantings continue to expand very considerably. Nevertheless it will become increasingly important both for farmers to achieve better and more uniform tree yields and improved standards of grading, if this commodity is to be able to compete favourably in world markets.

66. It is remarkable however how popular this crop has become and its cultivation is now widespread throughout the South and centre of the country.

67. *Palm Kernels*.—Exports rose slightly by nearly 2,000 tons for the first time since 1954; the Produce Marketing Board continuing to maintain producer prices at £28 18s. 0d. per ton.

68. Distribution of improved seedlings continue from district council nurseries, but in most areas oil palms are the least popular of tree crops, and they unfortunately receive inadequate attention from farmers. It is primarily for this reason that the Government is now introducing the new policy of encouraging major plantation establishment.

69. *Palm Oil*.—Imports were continued on a reduced scale and it is likely that 1959 will see a return to local self-sufficiency in this commodity.

70. *Ginger*.—Once again prices declined, although a slightly larger export nevertheless resulted, 789 tons compared to 700 in 1957, with a value of £70,050, less than half that ruling only two years ago.

71. *Kola*.—Exports increased for the first time since 1955, being 1,035 tons, almost entirely to the Gambia, compared to 736 tons in 1957, although once again the valuation was lower.

72. *Piassava*.—This is yet another commodity which has suffered a further set back in prices, but nonetheless the quantity exported showed an increase over last year. Trade Report figures, which since 1955 have shown Prime Sherbro grade (Two Seal) separately from Sulima grade (One Seal), indicate an annual increase in production of the former grade.

C—SOIL CONSERVATION

73. No major problems arose, though sheet erosion, because of upland shifting cultivation, is still insidious in most areas; it is primarily for this reason that the department has long advocated the greatest possible utilisation of swamps for rice cultivation and proper land use on the uplands.

74. A few more farmers in the Colony area were assisted in terracing their gardens, and the others already established were satisfactorily maintained.

75. In Koinadugu district, the Cattle Owner Settlement Scheme, combining early burning and stock control, has resulted in intensive regrowth of bush on previously severely eroded cattle "warri" areas. Trials to establish *Pueraria phaseoloides* on these bare patches promise well.

D—THE QUALITY OF AGRICULTURAL PRODUCE

76. The very high standard attained this year for cocoa, 99 per cent of which was graded in the top quality, has already been stressed. Coffee, on the other hand, is less satisfactory and it is hoped that grading standards can shortly be made stricter to fall more closely into line with those operating in East Africa.

E—STAFF TRAINING AND AGRICULTURAL EDUCATION

77. The Training of new Agricultural Instructors continued at Njala, with ten, including two Gambian students and two for the West African Institute for Oil Palm Research, successfully passing out. Fourteen students, including one Gambian and two for the West African Institute for Oil Palm Research, completed their first year at the College, and twelve having spent a year in the field begin their three year's College course in 1959.

78. Standards of educational entry to the College remain perforce disappointingly low, although an occasional candidate with a G.C.E. is now beginning to appear.

79. Mr. S. A. Kawa completed his second year post-graduate training at the Imperial College of Tropical Agriculture, and on his return to Sierra Leone in July was appointed an Agricultural Officer. Mr. S. A. Jabati after obtaining the College Diploma in Agricultural Engineering moved from Writtle Farm Institute to I.C.T.A., and Mr. M. B. Alpha from Reading University to Writtle.

80. Mr. N. A. Taylor, who was awarded the Everard Hosking Medal for the most outstanding contribution to college life during the year, also successfully obtained his C.D.A. at Seale Hayne and returned to Sierra Leone as an Agricultural Superintendent. Messrs. E. K. Bendu and A. Koroma

moved on for their first year at Seale Hayne and Messrs. A. U. Beckley and A. B. S. Turay left for the United Kingdom and started their training at the Nottingham Farm Institute.

81. A number of potential Agricultural scholars spent some months working with the department in the field whilst awaiting the results of their Higher School Certificate examinations; unfortunately all but Mr. W. E. Taylor, had to revert back to take this examination again. Mr. Taylor proceeded to the United Kingdom to take a preliminary course towards a degree in Agricultural Entomology at the Regent Street Polytechnic in London.

82. Mr. H. O. Jarrett successfully completed his Ph.D. at the Imperial College, London in Soil Chemistry, but did not return to Sierra Leone.

F—RESEARCH

83. The work of the West African Rice Research Station is dealt with annually in a separate report. The Director of Agriculture remains responsible on behalf of the Sierra Leone Government for the overall direction of this work.

84. The department's own research programme continued to be restricted owing to the absence of a Systematic Botanist, and an Entomologist; and because of Mr. Chisnall's untimely death, the boliland soil survey work was also in abeyance from January to November, when Mr. A. R. Stobbs arrived on secondment from the Colonial Pool of Soil Surveyors to complete this.

85. The work of the Agricultural Chemist and Plant Pathologist is covered in later sections of this report.

86. Close and valuable co-operation continues with the West African Institute for Oil Palm Research substation at Njala, whose staff are also now undertaking a number of valuable wild palm yield recordings in different parts of the country, in addition to a specific programme of trials on old Njala farm.

G—GENERAL

87. Whilst 1958 was a poor year for upland rice crops and coffee, it was generally satisfactory for all other crops, and there were encouraging signs at the year's end that agricultural production was beginning to recover from the decline which had coincided with the diamond rush in recent years.

88. The upland rice crops were unsatisfactory because early and unseasonal rains resulted in a poor burn, and a decreased acreage. Extra weeding was also necessary in the main Scarcies swamp areas.

89. District Councils continued to be short of funds for agricultural work, and generally are perforce having to relinquish many of their original intentions, except where they can be assisted through Produce Marketing Board grants for cocoa and oil palm nurseries.

90. The Deputy Director visited Benin in Nigeria for the meeting of the West African Institute for Oil Palm Research Managing Committee in March, and the Directors of Agriculture Conference and the Fourth Annual Meeting of the Inter-african Phytosanitary Commission in the United Kingdom in October. The Director visited Messrs. Firestones plantations in Liberia in August.

91. The Officer in charge, Rice Research Station, paid a brief visit to the F.A.O. headquarters in Rome, and spent a few days at the Italian Rice Research Station at Vercelli, whilst Dr. Hart and Dr. Roberts paid advisory visits to the Gambia and Nigeria respectively.

92. Two more pamphlets were published during the year in the departmental farmers guide series, entitled "Notes on Poultry Keeping", and "Notes on Rabbit Keeping".

93. Mr. F. C. Deighton, O.B.E., lately Plant Pathologist in the Sierra Leone Department and now at the Commonwealth Mycological Institute Kew, followed the publication in 1956 of his very valuable "The Diseases of Cultivated Plants in Sierra Leone", with an equally valuable "Vernacular Botanical Dictionary for Sierra Leone", which has been prepared over many years and was originally sent to the Printers in 1955.

J. W. D. GOODBAN,
Director of Agriculture.

PART II—THE WORK OF THE DEPARTMENT OF AGRICULTURE

A—ORGANISATION AND STAFF

94. The organisation of the new Cocoa Virus Survey Unit of the Department was worked out but will not be inaugurated until 1959.

95. It is with the deepest regret that the death of Mr. J. C. Chisnall, Soil Surveyor on secondment from the Colonial Pool of Soil Surveyors, at Kontobe, Tonkolili District, on 12th January is recorded, and of Mrs. R. G. Routley, wife of Mr. R. G. Routley, Agricultural Superintendent (Mechanical), at Bonthe on 11th December.

96. Congratulations are extended to Mr. T. S. Jones, Deputy Director, on the award of an O.B.E. in the Birthday Honours for his services to Agriculture in Sierra Leone.

97. Mr. R. A. Kitching, M.B.E., Senior Agricultural Officer, retired on pension at the end of the year after 29 years in the service, the earlier part of which was in the West Indies. Amongst others to leave Sierra Leone, Mr. E. H. Nichols, Principal Agricultural Officer, proceeded on leave prior to transfer on promotion as Assistant Director of Agriculture, Hong Kong; Mr. C. J. Piggot, Agricultural Chemist, proceeded on leave prior to transfer to the Seychelles; Mr. G. B. Foday, Agricultural Superintendent retired after 30 years service in the department in April; Mr. D. C. Mackenzie, Agricultural Officer resigned in November; Mr. D. F. Howson, Agricultural Engineer on contract left in September and Mr. J. R. Wells, Agricultural Superintendent on contract left in October to go to Canada. Mr. S. G. Day, Mechanical Superintendent transferred to the Department of Commerce and Industry on promotion as Commerce and Industries Officer (Technical).

98. Promotions included Mr. H. D. Jordan, Systematic Botanist, to Officer-in-Charge, West African Rice Research Station Rokupr in January, Mr. R. S. Liney, Agricultural Officer, to Senior Agricultural Officer in August and Mr. W. J. Aboko-Cole, Senior Agricultural Instructor to Agricultural Superintendent in May.

99. New appointments included Dr. P. R. Hesse, Senior Scientific Officer (Soil Chemist) who arrived on transfer from the East African High Commission in January; Mr. R. S. Liney, Agricultural Officer who arrived on transfer from the Gambia in August; Mr. C. R. Dunton, Agricultural Officer who arrived on transfer from Aden in February; Mr. S. A. Kawa, Agricultural Officer who arrived on first appointment in July; Mr. A. J. Carpenter, Scientific Officer (Botanist) who arrived in October; Mr. J. W. O. Jeffery, Scientific Officer (Soil Chemist) who was appointed in December; Mr. R. A. Stewart,

Agricultural Engineer, who arrived in December; Mr. A. R. Stobbs, Soil Surveyor (Chemist) who arrived in November on secondment from the Colonial Pool of Soil Surveyors; Mr. L. W. Dale, Temporary Agricultural Superintendent (Mechanical) who arrived in March; Mr. J. B. Whitting, Temporary Agricultural Superintendent who arrived in May and Mr. C. W. Oliver, Temporary Agricultural Superintendent who arrived in October.

100. Mr. N. A. Taylor, having completed his departmental scholarship course and obtained a College Diploma in Agriculture at Seale Hayne Agricultural College, was promoted to Agricultural Superintendent on his return in October.

101. Mrs. E. H. Roberts ably filled the post of Botanist at the West African Rice Research Station until the arrival of Mr. A. J. Carpenter.

102. Mr. H. D. Tindall, Horticulturist, proceeded on one year's study leave in August to work on tomato and allied plants at Reading University, and Mr. W. Macnab, Agricultural Officer, proceeded on one year's study leave in September to take the course leading to the National Diploma in Poultry Husbandry at the West of Scotland Agricultural College.

103. Despite the new appointments a considerable number of vacancies still remained at the end of the year, and the shortage of staff in the clerical grades continued seriously to affect the work of the Department.

B—AGRICULTURAL STATIONS

Experimental Station, Njala:

104. *General*—The continuous cropping experiment with groundnuts was continued and variety trials carried out. Similar work was done with yams. *Stylosanthes gracilis* was available for livestock throughout the year and it was also the most successful of the cover crops maintained on the station. The seedlings available from the germination of the one-hundred thousand E.W.S. oil palm seeds received from the West African Institute for Oil Palm Research, Benin, in 1957, were distributed; 42,848 seedlings to Masanki and 19,115 to the Sahn nurseries. In October fresh E.W.S. seed for 1958–1959 germination was received from Benin. Angola seed from Masanki was also germinated. In October another consignment of Amazonian cocoa pods was received from the West African Cocoa Research Institute, Ghana and was planted in pots for preliminary observation. Germination was not as good as last year, but 1,663 seedlings were raised. 2,900 seedlings nursed in January and December, 1957 were sent to the Cocoa Development Station at Kpuabu. The coffee trees at Njala were all yield recorded and the three stem system of pruning was practised. Block 17 was replanted using pigeon peas as temporary shade. 1,000 coffee seedlings were supplied to the Agricultural Officer, Port Loko and 1,430 to the West African Institute for Oil Palm Research Substation at Njala. A large number of pineapple suckers were sent to the Horticulturist and 700 were supplied to Bo school. A pilot trial using calcium carbide solution to induce fruiting was carried out and 66 per cent of the plants developed fruit within one month. Two rubber clones were introduced from Messrs. Firestones in Liberia and a considerable number of seedlings of their best clonal cross were raised from seed for subsequent trials and budding.

105. *Pigs*—The health of the pigs was not good early in the year. There were three still born litters and several cases of trypanosomiasis. Health improved when the quality of the ration was improved. New importations from the United Kingdom included a Large White boar, a Wessex Saddleback boar and an in-pig Middle White gilt. Twenty-two pigs were sold for breeding and fifty-three were sold for pork. Litter average at birth was 10.5 and at weaning 6.5.

106. *Poultry*—The health of the birds was good until July when an outbreak of fowlpox affected all the birds on free range. Many were culled; the flock recovered after inoculations but egg production was reduced for several weeks and the chicks hatched at this period tended to be weakly. Fertility improved to 80.7 per cent. Hatchability was also better at 74.9 per cent. 10,272 chicks were hatched during the year and the rearability obtained was 74.5 per cent; 6,268 chicks were sold to local farmers at 6 weeks old, and a further 715 were sold in other areas. Sales of birds of all ages totalled 7,613, a new record which still did not satisfy the local demand for improved poultry. The Muscovy ducks continued to thrive and 252 ducklings were hatched. 115 adult birds were sold for table use and 59 ducks were sold for breeding. The flock of Chinese geese was sold.

107. *Rabbits*—The litter average was low being only 4.0. Sales increased to 157 rabbits of all ages compared with 54 in 1957. The health of the rabbits was satisfactory and litter numbers improved at the end of the year.

108. Details of crop experiments are given in Appendix III.

Experimental Station, Newton:

109. *General*—Work continued along the same lines as in previous years with livestock, tree crops, annual crops, grassland and intensive valley cultivation directed to the evolution of a system of permanent farming suitable for the Colony area.

110. *Cattle*—The health of the herd remained satisfactory. Nine calves were born during the year with an average birth weight of 40.5 lb. One bull calf weighed 48.5 lb. at birth; this is a record for this station. Bull B. 35 was received from Musaia to replace B. 39 who was becoming too old and whose own daughters were coming into service.

111. *Pigs*—The health of the herd continued to be unsatisfactory. Eighteen mature pigs died during the year, at least six of these deaths were caused by trypanosomiasis. Almost all these losses occurred in the months of July–October. Trials with Antrycide Suramin complex at the Veterinary Headquarters, Teko during the same period gave effective protection against trypanosomiasis. All stock were inoculated with this new drug during October. No deaths from trypanosomiasis occurred after this and it is hoped that the health of the herd will continue to improve.

112. The herd was vaccinated against swine erysipelas in March and all placed on the standard ration available from the Rice Mill. The condition of the stock deteriorated; the average number reared per litter to eight weeks being only four, the lowest for five years. It was thought that these troubles were due to poor nutrition but it was probably also due to the build up of trypanosomes in the herd.

113. 62 pigs were sold for breeding and 83 were sold for pork. The commercial piggery was closed at the end of 1957 having proved that one man with the necessary capital could make a very reasonable income from a pig farm with about 10 sows. Revenue therefore dropped slightly but owing to the feeding of cheaper food the profit was the highest yet recorded.

114. *Poultry*—8,433 chickens were sold during the year of which 3,725 were sold at day old and 3,805 at 6–8 weeks. These figures give some indication of the increasing importance of the poultry industry in the Colony area. At the end of the year there was a long waiting list for chickens. The fact that local farmers are able to rear chicks from day-old at all times of the year speaks highly of their husbandry methods which they have acquired through advice from the itinerant staff and by studying the methods employed at Newton.

115. In view of the increasing importance of the day-old trade it was decided to start sex link crossing whereby the resulting pullet and cockerel chicks can be distinguished at day-old by colour differences. The keeping of White and Black Leghorns was discontinued and their place taken by Brown Leghorns. 260 Brown Leghorns were imported at day-old during the year and 296 day-old Light Sussex.

116. The incubators worked at capacity throughout the year. 10,908 chicks were hatched compared to 5,075 during 1957 and 550 day-old chicks were received from Njala. Average fertility of 72.0 per cent was a slight improvement on last year and it is hoped to raise this further. Hatchability rose to 76.8 per cent and rearability to 8 weeks old was maintained at 78.6 per cent. Egg production was also a record; 89,259 eggs were laid of which 23,239 were incubated, 1,452 were sold for hatching and 61,334 were sold for table use.

117. Work done on the fattening of Muscovy ducks during 1957 was so encouraging that it was decided to import Aylesbury ducklings and to try a good egg laying breed. 73 Aylesbury and 54 Khaki Campbell ducklings were imported at day-old. 32 Khaki Campbells were reared and commenced laying when four months old. 59 of the Aylesbury ducklings were reared and commenced laying when five months old. The stock of both breeds is being built up. The Muscovy ducks continued to do well. 665 ducklings were hatched naturally and 44 hatched in incubators. Success was achieved in the rearing of ducklings in home-made 'dexion' brooders.

118. A record number of ducks were sold, 342 for breeding and 168 for table use. 3,179 eggs were laid, 1,402 were used for hatching, 122 sold for hatching and 1,401 sold for the table. The Chinese geese laid 262 eggs during the year; 51 goslings were hatched and 64 geese of all ages were sold for breeding.

119. *Rabbits*—Health was satisfactory and mortality fell from 12.9 per cent in 1957 to 8.8 per cent. 149 rabbits of all ages were sold for breeding, 17 were culled and sold for table use and 14 were transferred to other stations.

120. *Model Holding*—The former tenant retired at the end of 1957. The holding had been neglected due to his illness and the new tenant, a retired Departmental labourer, was paid wages for the first 3 months of 1958. He was supplied with two gilts and two hogs, three pairs of chickens, four ducks and one pair of rabbits. Two pigs were sold for pork at the end of the year and the model holder purchased five weaner pigs from the Department with the revenue obtained. His rice crop failed due to late planting.

121. *Tree Crops*—All oil palms planted on the station were in bearing and yields were recorded. The ground cover under the citrus, avocado pears, cashew nuts and coconuts was maintained using the Caldwell 'bush hog.'

122. *Annual Crops and Grassland*—Once again early planting of yams and large sets gave the highest yields. Rotational cropping continued and cassava was grown for livestock food. Pangola grass, *Digitaria decumbens*, was planted on a half-acre plot of the annual strips during July and established itself fairly well but establishment was poor in two paddocks planted in the livestock section.

123. *Intensive Valley Cultivation*—The East valley continued to be used as a demonstration of intensive valley cultivation which any local farmer can copy. Rice (variety D 99) was grown in the wet season and vegetables in the dry season. Good crops were obtained. Cocoa and coffee seedlings were also raised. 2,286 lb. of pineapples were harvested and 120 pineapples were exported to the United Kingdom in a trial shipment early in December.

Animal Husbandry Station, Musiaia:

124. *Cattle*—The long-term selection work aimed to obtain an early maturing beef strain of Ndama type cattle continued. The organisation of the herd was modified in the off season by the amalgamation of the four cow herds to form one herd and of the two bull herds. The three large herds namely cows, heifers and bulls economised in the cost of labour for supervision, made an effective system of rotational grazing possible and facilitated control of worm infestation. The total head of cattle rose to 269. Seventy-nine calves were born, the same number as in 1957 and compared to 46 in 1956. The average birthweight fell to 36.2 lb. from 40.51 lb. in 1957. (*N.B.* The average for 1956 was 38.8 lb.—incorrectly printed in the 1957 Annual Report as 33.8 lb). Helminthiasis was troublesome but with this exception health was good. Seventeen deaths occurred, all of these being sucklings or weaners. Worming of young stock and routine inoculations against anthrax, black quarter, rinderpest and contagious abortion were carried out. Only one cow aborted and this was due to injury and not disease.

125. *Sheep*—Helminthiasis continued to be a major problem. This disease resulted in the ewes being in poor condition at lambing and many of the lambs quickly succumbed. An excellent total of 61 lambs were born but 42 of these died and in addition 25 older animals died including two young rams introduced from the Gambia.

126. *Poultry*—The health of the poultry showed a marked improvement over the last year but hatchability and rearability remained low. 456 birds were sold for breeding to farmers in Koinadugu and Bombali Districts. The stock at the end of the year was 271 birds of all ages. In response to local demand a small flock of ducks was introduced from Newton.

127. *Maintenance*—A considerable amount of new fencing was erected and other fences repaired. It was found that to contain the cattle eight strand barbed wire fences were necessary. This work has been given priority to safeguard the breeding programme and so that rotational grazing methods can be applied. The Ferguson scraper blade was of great value in maintaining station roads.

128. *Pasture Work*—The observation trials on grasses laid down in 1956 were continued; of these *Axonopus africanus* and *Brachiaria mutica* are the most promising. Half-acre observation plots of seven short habit grasses and forage crops were laid down. The grazing trial at Kabakeya is now in its second year; it was evident that *Panicum maximum*—Dwarf Guinea grass, *Panicum maximum*—strains C.P.I. 8357 and C.P.I. 8387 and *Pennisetum setosum* do not withstand heavy grazing and were overcome by weeds. *Panicum maximum*—tall and *Setaria kasungula* were fairly good and *Brachiaria mutica* was the best in giving the highest returns in liveweight increase per cow-day/acre. The grass management trial was continued but it was decided that assessment in the future should be based on botanical survey and not liveweight increase of grazing animals, as the latter was unsatisfactory because of too much variation in the stock available.

C—HORTICULTURAL SECTION

129. *General*—The Horticultural Section continued to provide technical assistance and advice to vegetable and fruit growers with the object of improving the quality and quantity of their produce. Planting materials, seeds and fertilizers were sold to the public.

130. There was an increase in extension work activity in the Provinces. Interest in the growing of vegetables and economic trees was stimulated resulting in many requests for seeds and planting materials. At Bo the continued increase in the number of growers necessitated the posting of two additional instructors to that area.

131. The advice given to growers to enable them to increase yields and quality was based on the results of experiments carried out. During the year the introduction and testing of new varieties of vegetables continued. Normal commercial fertilisers and proprietary brands were also tested and advice to growers was based on these findings.

132. *New England Horticultural Station*—Many members of the general public and visitors from overseas visited the Section headquarters at New England to see the improved methods, techniques and plant varieties recommended by the Department. The appearance of the Station was made more attractive by the removal of the old Nissen hut store. A new store and Instructor's office was completed. Improvements were made to the vegetable plant house. Additional permanent terraces were made and the upper vegetable garden terraces all now have masonry retaining walls. A terrace above the main stores was completed where a collection of introduced plants will be established.

133. *Lumley Horticultural Sub-station*—This sub-station is the main nursery for the production of citrus and other economic trees. The programme of contour terracing was continued. A collection of plants obtained from the French Guinea Fruit Research Station at Kindia was established, consisting mainly of citrus, pineapples, mangoes and avocado pears. In the swamp land a rice variety trial was planted during the wet season.

134. *Regent Nursery*—Propagation of citrus continued on all of the upper terraces. Stock plants, to provide bud wood for propagation, were established in various parts of the station. In the dry season established varieties of vegetables were grown for seed production and trials of new varieties continued. The advisory service for the people of the mountain districts was maintained and seed, insecticides and fertilizers were distributed.

135. *Kabala Horticultural Sub-station*—This station is the demonstration, advisory and propagation centre for the Northern Province. During the year further terraces were made and planted with lemon grass (*Cymbopogon citratus*) and vetiveria (*V. zizanioides*) to prevent erosion of the new bunds. The collection of cover crops was maintained to protect the fertility of the soil in the permanent tree blocks and for the production of seed which was supplied to farmers and gardeners to assist in soil regeneration and erosion control. The vegetable section was devoted to trials with fertiliser, new varieties and the production of seed. A method of growing vegetables on ridges was developed. Advice was given to vegetable growers on their problems. The supply of planting material, fertilizers, insecticides and seed to growers continued.

136. *Distribution of Planting Material*—The table below gives comparative figures showing the general upward trend in the sales of planting materials excluding cuttings, and seedlings (not in baskets) since 1952. Although there was a decline in sales this year the demand for planting materials is encouraging.

				<i>Economic plants</i>	<i>Ornamental plants</i>
1952	..	..	..	796	460
1953	..	..	..	1,599	870
1954	..	..	..	3,898	1,970
1955	..	..	..	4,244	6,760
1956	..	..	..	3,547	6,916
1957	..	..	..	4,585	7,502
1958	..	..	..	3,367	6,504

In addition 26,821 cuttings and ornamental seedlings (not in baskets) were sold.

Distribution of vegetable seeds continued and a total of 11,433 packets were supplied, a considerable proportion of which was produced on the demonstration gardens of the section.

137. *Plant Introductions*—One hundred new introductions were made. These included three new varieties of cassava from Nigeria and many fruit tree introductions from French Guinea mentioned in paragraph 133.

138. *Experimental Work*—Trials with new vegetable varieties continued under the range of conditions available at the various sub-stations, where fertiliser experiments were also carried out. Control of the important disease, 'Bacterial wilt' of tomatoes continued to be investigated. A series of experiments was started using formaldehyde and Jeyes fluid as a soil treatment prior to planting. Both treatments have reduced mortality and given slight yield increases and this experiment is being continued on the same plots. Welsh onions showed a very marked response to applications of a mixed fertiliser at the rate of 1 oz. per square yard applied at three weekly intervals and gave twice the yields of the unfertilised control plots. The 1957 experiments with polythene sheeting used as a protection for lettuce during the wet season were repeated this year in trials in which other vegetables were included. Considerable differences in growth were recorded but lettuce proved to benefit most greatly.

139. *Extension Work*—Agricultural Instructors continued to encourage school gardening and advise farmers on all aspects of horticultural work. Advisory work in the Provinces increased and numerous requests for assistance were dealt with by the Bo office.

140. *Terracing Scheme*—During the early part of the year terracing of hillsides in the Colony area, devoted to permanent crops continued. Latterly no new work was undertaken but attention was centered on supervision of farmers previously assisted during the first four years of the scheme.

141. *Horticultural Show*—The seventh Horticultural Show was a very popular and successful event. It was held under the Patronage of His Excellency the Governor and was opened by Lady Dorman at the British Council Headquarters in Freetown. Horticultural exhibits were staged at the Pujehun, Kenema and Kailahun Agricultural Shows.

142. *Technical Propaganda*—Two additions were made to the series of "Horticultural Notes" which contain technical advice on specific aspects of horticulture and are issued free of charge to growers. The pamphlets added this year are:—

No. 19 Horticultural Chemicals—Preparation and Uses.

No. 20 Economic Fruit Trees, Shrubs and Climbers in Cultivation in Sierra Leone.

D—WATER CONTROL SECTION

143. Large areas of swampland in the Scarcies area have not been developed for rice cultivation because of inadequate drainage causing deep flooding and acid conditions. By improving drainage conditions and allowing free tidal wash these areas can be reclaimed and the Department has proposed a series of schemes to bring into production large areas of potentially excellent rice lands by using mechanical excavators and other modern plant to construct drainage channels.

144. The first stage of this programme, the reclamation and development of 5,000 acres of swampland at Funkedeh and Yakban under Colonial Development and Welfare Scheme, D. 3166 made excellent progress during the year. The start of this work was delayed until 1958 owing to the late appoint-

ment of the Irrigation and Drainage Engineer. The five Priestman $\frac{3}{8}$ cubic yard Dragline excavators were received in February and were transported to Rosino in the Scarcies area by the Public Works Department landing craft and from Rosino to Funkedeh by road. The performance of these machines was satisfactory and the only unforeseen trouble experienced was the high rate of wear of the pins and bushes on the bucket sheaves; this was attributed to a combination of highly acid water conditions and fine sand. All other auxiliary plant and equipment was received by the end of June.

145. The work of inspection and survey was greatly facilitated by the provision of a fibre glass launch and B.S.A. Bantam motor-cycles, the latter being particularly useful as they can be transported by launch and used along bush paths and bunds.

146. The Funkedeh swamp of 1,000 acres was surveyed and main and side drains set out. The total length of the main drain is 10,976 linear feet and of side drains 27,650 linear feet involving a total of 123,450 cubic yards of excavation. Construction commenced on 11th of April and by the end of the year 7,900 linear feet of the main drain and 13,000 linear feet of side drains, a total of 80,374 cubic yards of excavation had been completed. The effect of the new channels was to allow tidal conditions to exist and it was noted that acid conditions were rapidly moderated as indicated by changes in vegetation and it is expected that a considerable area of this swamp will be planted with rice next year.

147. The project at Yakban was surveyed; plans were prepared and it was set out for construction work. Excavation will commence shortly in the Makot section of this swamp.

148. An investigation of the Maseba Creek swamp was undertaken and funds are being sought for development. The reclamation of this swamp involves the construction of large and deep channels to remove surplus water, as at present the drainage channels are small and overgrown and by August every year the whole swamp area is flooded to a depth of several feet. Water level guages were set up and flood heights read throughout the year.

149. At the end of the year the Irrigation and Drainage Engineer was made responsible for the maintenance and future development of the established polders at Mapotolon, Bakepet, and Maswari, the first two of which were formerly under the control of the District Councils and the third under the Public Works Department.

150. The investigation of the extensive swamplands in the Scarcies and elsewhere has been greatly aided by the work of the Directorate of Overseas Surveys. Print Lay-downs, accurate topo-sheets and land-use maps which they have prepared from the recent aerial survey have greatly reduced the amount of field work and preliminary investigation necessary.

151. The Headquarters of the Irrigation and Drainage Engineer has been established at Makot. Building work at the base commenced in January and by the end of the year an office, store, fitter's workshop, blacksmith's shop and generator house were completed. The Engineer's quarter was also finished and seven staff families housed. The quarter for the Superintendent of Works will be completed early next year.

E—EXTENSION WORK

SOUTH-WESTERN CIRCLE (PUJEHUN—BO—MOYAMBA)

152. *General*—The mechanical cultivation sub-station at Gbundapi was further developed by the completion of a rest house for the Officer-in-charge and a power house in which a Lister diesel generator was installed. Full use of electrical equipment was possible by the end of the year. The Uniport tent (a portable metal rest house) was transferred from Naji to Gbundapi and re-erection commenced. The junior service quarter was completed at Juring and a quarter for Farm Guards was built at Pujehun.

153. *Rice*—Due to early rains the “burns” on upland farms were very poor and some farms were abandoned. Interest in the farming of Inland swamps was therefore greater than in 1957. A small rice farm of $1\frac{3}{4}$ acres was established at Mandu and the varieties Toma 112 and Bolo 108 were planted and yielded 32.6 bushels of paddy per acre. This seed will be distributed to farmers in 1959 there being a high demand for suitable varieties for inland swamps.

154. *Mechanical Cultivation*—A further reduction in acreage ploughed was made largely because of the changes in policy whereby a deposit was this year requested in advance. No cultivations were done at Juring or Sulima where fee repayments are still in arrears and a further area of the established Gbundapi site was handed over to the Co-operative Societies who ploughed and allocated 1,050 acres for Society members. The acreages cultivated by the Department annually since 1951 are shown below:—

Site	1951	1952	1953	1954	1955	1956	1957	1958
Gbundapi	.. 32	403	321	256	303	559	522.5	312
Njeilonda	.. —	—	107	198	210.5	229	249.5	209
Panga Krim	.. —	—	—	24	17	22	—	—
Saama	.. —	—	170	130	—	—	—	—
Sulima	.. —	—	25	403	617.5	458	118.5	—
Bombohun	.. —	—	—	—	—	—	96.5	38.5
Malen	.. —	—	—	—	—	216	534.5	206.5
Gondama	.. —	—	—	—	—	—	84	71
Total	.. 32	403	623	1,011	1,148	1,484	1,605.5	837

Generally yields were satisfactory on all sites although early flooding caused some apprehension but only slight damage.

155. *Cocoa*—The cocoa plantations in the Circle are concentrated near the Kenema District border in the North-west of the Pujehun District and the South-west of Bo District. 11,720 cocoa seedlings were supplied to farmers from District Council nurseries in Bo, Pujehun, and Moyamba Districts. Advice was given to farmers about the layout and upkeep of plantations and preparation of the crop for marketing. The quality of cocoa produced was good. The main pest is the monkey, whilst only small areas of Black Pod, *Phytophthora palmivora* Buter, and capsid damage were seen. It is hoped to carry out extensive monkey drives next year.

156. *Amazonian Cocoa Introductions*—Despite damage by monkeys the plantation at Futa yielded sufficient seed to establish a nursery of 719 seedlings at Pujehun. Most of the seedlings were of the type T60. It appeared that this type is earlier bearing than both T85 and T12 in the Futa plantation. The seedlings will be distributed in lots of 50 to master farmers under supervision.

157. *Coffee*—This crop was the most popular plantation crop in the circle owing to the comparative ease of its cultivation and preparation, the good price which has been paid and its comparative freedom from monkey

damage. 3,328 seedlings were distributed from Bo District Council and 39,900 seedlings from Moyamba District Council nurseries. Coffee stem borer, *Bixadus sierricola* was noted in most parts of the Circle.

158. *Piassava*—The quantity and quality of piassava produced has been maintained despite the low price, because this product provides the main source of income for some farmers in the south of Pujehun District.

159. *Oil Palms*—The demand for seedlings continued to fall and only 8,561 were distributed.

160. *Oil Palm Development Projects*—Apart from Masanki the only Pioneer Oil Mill which operated during the year was at Sahn in Pujehun District where at the peak of the season the supply of wild fruit was in excess of the mill capacity. An oil palm nursery was established at Sahn with E.W.S. seedlings germinated at Njala, and it is proposed to establish initially, oil palm plantations of 1,000 acres each near the two Pioneer mills at Sahn (Malen) and Kangha (Jimmi Bagbo). The Bo District Council project at Gbaama continued, the Chiefdom Authorities agreeing to lease 250 acres of land for this plantation near the Telu Pioneer mill of which 28 acres have already been planted. The Moyamba District Council made preliminary arrangements to lease 300 acres of land near Bradford for a plantation near the Masanki mill. The establishment of plantations of improved palms near existing Pioneer mills will assure regular supplies of fruit to the mills and encourage farmers to establish their own plantations.

161. *Masanki Oil Palm Plantation*—The replanting programme for the Produce Marketing Board continued and 157 acres were replanted with E.W.S. seedlings. This brings the total area replanted to 257 acres. Line-felling of old palm trees continued in preparation for the 1959 planting season. 31,046 E.W.S. seedlings were transferred from the raised trays to the nursery. Consignments of germinated E.W.S. seed were received from Njala and by the end of the year 19,732 seedlings were established in raised trays. These seedlings will be transplanted in the 1960 planting season nursery and the site for this was prepared. This programme is, for convenience, at present being supervised by Agricultural Officer Colony.

162. *Rubber*—The Chemist and Agricultural Officer reconnoitred an area near Zimmi for possible rubber plantation development, which was subsequently inspected by a three-man investigation team from the Colonial Development Corporation in November.

163. *Livestock*—Interest continued to be shown in the keeping of improved poultry distributed by the Department. Pig keepers continued to show satisfactory progress, with two or three individuals showing considerable initiative in combining pig keeping and vegetable production for supply to the Bo area.

NORTH-WESTERN CIRCLE (PORT LOKO—SCARCIES)

164. *General*—The establishment of the mechanical sub-station at Katonga was virtually complete by the end of the year. A store, implement shed, power house, office and a junior service quarter were built and the workshop area was protected by a fence. A new office was built at Port Loko and the original office was demolished. A rest house was built at Mandu. There was a very large drop in the acreage mechanically cultivated for farmers. Advice was given to the District Councils regarding the upkeep of polders and drainage projects but the control of these will become the responsibility of the Irrigation and Drainage Engineer next year.

165. *Mechanical Cultivation*—The area cultivated was only 320 acres, as compared to 2,334 acres in 1957. Farmers sold their 1957 rice crop at a late date and it was not possible to commence ploughing until they had paid their 1957 fees and the 10s. advance for cultivations required in 1958. Work was not started until April when farmers began to pay outstanding ploughing fees. Excellent crops were obtained from most of the acreage planted and it is hoped that farmers will overcome their reluctance to pay for ploughing in advance. At harvest time farmers began to pay some of their arrears and, although the position still remains disappointing, it is hoped that when the main sales have been completed the position will improve.

166. *Development of Lophira Bush*—Maintenance of the small trial plot of oil palms at Malal continued. Brushing was carried out at the beginning of the year and all the palms were ring-weeded. At the end of the year the plantation was brushed by double harrowing using a Ferguson with an off-set disc harrow; a fire break was also made. Of the 240 palm seedlings planted in 1957, 201 were fitted with wire collars. Out of the 39 without this protection, 10 were killed by "cutting grass" (*Thryonomys swinderianus*); only four replacements were necessary among the protected plants and it is probable that these were uprooted by wandering cattle which caused some damage.

167. *Oil Palms*—The small plantation of 710 palms established in 1959 at Katonga on Lophira bush land was given similar treatment to the Malal plantation. A Baron disc harrow was used for brushing in June and December and was very effective. 69 of the palms fruited. It was found that leaf yellowing was reduced by application of $\frac{1}{2}$ lb magnesium sulphate and 1 lb superphosphate to each palm. Arrangements are being made for this plantation to be taken over by local farmers. 8,102 oil palm seedlings were distributed from District Council nurseries in the Circle during the year but delays were caused by inadequate transport facilities.

168. *Livestock*—The District Council piggery at Rosint was closed down and the stock sold on the 24th of July owing to the continued financial losses incurred. There continued to be a large demand for Rhode Island Red poultry and a considerable number were obtained from Newton and sold to farmers.

169. *Mangrove Clearance*—32 acres were planted at Rowal by farmers compared with 42 acres in 1957. The laborious work of digging out "kiri kiri" grass, *Paspalum vaginatum*, is the main factor causing a loss of interest by local farmers, although the area cultivated yielded well. The swamp at Yaliba was not cultivated this year and it is apparent that rice cultivation will only be successful there if control of saline tidewater can be achieved.

SOUTH-EASTERN CIRCLE (KENEMA—KAILAHUN—KONO)

170. *General*—Six Agricultural Instructors were assigned to the three District Councils. Their duties were mainly concerned with extension work on oil palms and cacao and coffee establishment, with their preparation for market, and with the expansion of swamp rice cultivation. Surveys of potential sites suitable for the development of rubber plantations were also carried out.

171. *Rice*—There was a decrease in the area of upland rice and a considerable increase in the area of swamp rice. Pure-line seed rice was received from the Rice Research Station and multiplication was carried out at Kenema, Segbwema, Manowa, Kailahun, and Waiima. Seed rice was sold to progressive farmers in the three Districts. Demonstrations of the value of superphosphate fertiliser were laid down at Kenema, Segbwema and Kailahun. Sales of this fertilisers showed an encouraging increase in 1958.

172. *Cocoa*—The Department continued to encourage planting of cocoa on suitable sites as a more reliable investment than coffee, and the acreage planted showed a considerable increase. Advice and assistance was given to farmers on the selection of sites, planting, maintenance, control of pests and diseases and preparation for sale. The Co-operative Department's Cocoa Loan Scheme continued and loans to farmers for 314 acres of new plantations were issued. Departmental staff inspected and approved loans for 597 acres in Kenema District and 209 acres in Kailahun District. An encouraging increase in the proportion of Grade I cocoa occurred in 1958 and the Department continued to give advice on the best method of fermentation.

173. 1958 was not a bad year for Black Pod disease. Much damage is however caused each year by capsids, *Sahlbergella singularis*, and other species. Such damage was noted particularly in the Gaura and Luawa chiefdoms in 1958. Farmers were advised to maintain adequate shade in their plantations as the severest attacks were noticed on exposed cacao. Animal pests, notably goats and monkeys cause much damage every year. Goats can be controlled by fencing the plantations; monkey drives will again be organized in 1959, as the District Councils and farmers have not shown they can do this themselves.

174. A virus disease of cocoa similar to swollen shoot disease was discovered at Gandorhun, Jaluahun Chiefdom by an officer of the West African Cocoa Research Institute, Ghana. A further occurrence was discovered early in November at Giehun, in the Lower Bambara Chiefdom. Five officers visited Ghana to study survey and control methods there, so that a thorough survey can be carried out in 1959.

175. *Coffee*—Robusta coffee continued to be planted extensively throughout the Circle although the good prices which have been ruling, have begun to fall. Farmers were encouraged to harvest ripe berries only; Sierra Leone coffee has been at times faulted because much of the crop is picked before it is fully ripe and produces an inferior liquor. Unfortunately berry borer seems to attack ripening berries. Another common pest of coffee in the Circle is *Bixadus sierricola*. White, the large stem borer. The general high price of coffee and propaganda have led to a higher standard of plantation maintenance; yet even so improved cultural practices, including systematic pruning, and better quality are required to ensure a ready market for Sierra Leone coffee, and extension work therefore was continued with these particular objectives in view.

176. *Oil Palms*—8,211 seedlings were distributed from District Council nurseries. The yield recorded, Angola palms at Kenema Farm produced 7,731 lb. of fruit. Further planting at the Senehun plantation increased the area to 200 acres. No further planting was done at Worodu plantation where there are 55 acres of oil palms.

177. *Cocoa and Coffee Development Station, Kpuabu*—A second Agricultural Instructor's house, a rest house, an office and store were built. A lease on a further 20 acres of land was prepared bringing the total area of the station up to 165 acres.

178. The station was established under Colonial Development and Welfare Scheme D. 3055 last year. The Amazonian cocoa seedlings planted in 1957 made satisfactory progress; the best trees reached 10 feet in height and a stem circumference of 4–5 inches. Fifteen trees were killed by stem borer, *Xyleborus morstatti* Hag, although the stems and main branches had been painted with a solution of D.D.T. However a spraying with a B.H.C. insecticide in November against this pest and capsids was followed by freedom from damage by either pest.

179. The new planting this year was 2.4 acres. The seedlings had been grown at Njala from cocoa pods received from the West African Cocoa Research Institute, Ghana, in December 1956. The selections planted were the F2 generation of the selections T60, T63, T65, T72, T73, T76, T79, T82, T85 and T87. Growth was not as vigorous as was expected on the alluvial soil chosen; this may be due to the marked seasonal fluctuations in water-table level, as the site is near the stream.

180. Another consignment of cocoa pods was received in December, 1957 and, after nursing, the 2,174 seedlings raised were carried through the year in wire baskets. Further pods were received in September. In addition to F2 generation Amazonian selections, these consignments contained hybrids of Amazonian and Amelonado cocoa, for comparison with local cocoa.

181. 120 seedlings of Amazonian cocoa were distributed to farmers. Seed was obtained from trees at Konia and Futa where the first introductions were planted. These seedlings have aroused great interest amongst cocoa farmers and many applications have been received for seedlings in 1959.

182. Seed from the three highest yielding trees in the Black Pod spraying trials, local Amelonado, was planted and 1,983 seedlings raised. The trees from which the selection was made have been yield recorded for 3 years.

183. Spraying trials against capsids on cocoa were carried out using Gammalin 20. Trials with dieldrin, as Dieldrex 20, to control coffee stem borer were started.

184. Yield recording of coffee on the station was started. Seed was nursed from high yielding coffee trees and it is hoped to build up a stock of coffee of above average yield so that further selection and later vegetative propagation can be done. A nursery of 1,500 local rubber seedlings was made during the year from seed collected at Kenema and Joru.

SOUTHERN CIRCLE (BONTHE)

185. *Mangrove Swamp Reclamation*—The loans scheme for mangrove swamp clearance which started in 1939 was closed this year with the writing-off of the few remaining debts. This scheme led to the clearance and development for rice cultivation of a large area of mangrove swamp. It was followed in 1952 by a scheme for mangrove clearance by the District Council. This year 43 acres of mangrove felled previously at Pot-buth were cleared. Some 65 acres were allocated to farmers in 1958 under this scheme.

186. *Rice Trials*—(a) *Shenge Island*—The results of the observation trials of the past 4 years were summarised in the 1957 Report. The four best of these varieties were tested in a comparative yield trial with the established local varieties Bolo and Lead. The results were inconclusive as most of the plots were destroyed by fish soon after transplanting. Labour was not available to repair damage to the fish fence caused by wash from heavy launch traffic on the Jong River. 1958 was the first year of another observation trial comprising five new introductions together with two popular varieties on small plots. Results are given below:

<i>Variety</i>				<i>Yield Paddy per acre in lb.</i>
Seri Raja	..	..	..	3,550
Pindosein A29/20	..	..	..	3,400
Lead (local)	..	..	..	2,700
H.R. 8	..	..	..	2,300
Bolo (local)	..	..	..	2,200
Parn A-191	..	..	..	1,700
Anak Didek	..	..	..	1,700

(b) *Mechanical Cultivation Sites—Sewa Area*—Variety trials with Seri Raja, Pia Gazo, HR8 and Radin China 4, together with the local varieties Mareke and Mbagboli, as controls, were laid down at the Mayeke, Torma I, Gbeha and Bo sites. Fertiliser trials were laid down at Mayeke, Torma I and Torma II sites. The experiments were designed to be drilled with the Massey Harris 720A combine drill to give plots 140 inches wide and 100 yards long. Briefly, it was shown that Seri Raja and Radin China 4 were outstanding on the moderately deep flooding Mayeke site but that the local varieties were best on the other sites. The fertiliser trial at Mayeke yielded 50 bushels per acre but with no significant yield increases due to fertiliser treatments, although large increases were obtained on the other higher sites. The variety trial at Mayeke is summarised below:

				YIELD IN LB. PADDY	
				Total yield of four plots	Yield per acre
Variety					
Seri Raja	..	..		863	2,744
Radin China	..	..		701	2,222
Mbagboli (local)	..	..		694	2,197
Mereke (local)	..	..		576	1,829
Pia Gazo	..	..		544	1,727
HR8	..	..	..	243	775
				1,918 (average)	

187. *Mechanical Cultivation*—The 1957 crop was excellent. 42,178 bushels of husk rice were purchased at the Bonthe rice mill in March and April 1958 and in addition 10,864 bushels were sold to the Bo rice mill by the co-operative societies at Torma Bum and Yawbeko. The 1958 crop was good on most sites but the quantity of rice available for sale early in 1959 will be much lower as the acreage was reduced and a larger proportion of the yield will be absorbed locally.

188. The acreage allocated to farmers this year was 4,115 acres, and a further 71 acres were cultivated for farmers in Jimmy Gbagbo, Pujehun District. The reduction in acreage was due to wet weather conditions, the inadequate arrangements made to market the bumper 1957 crop thus delaying the payment of 1957 ploughing fees, and the advance payment of 10s. per acre for 1958; fees totalling £16,000 were collected. The progress of the scheme is shown in the following table:—

<i>Year</i>	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
<i>Acreage</i> ..	4	70	282	466	1,126	2,278	4,073	5,530	5,302	4,186

A record of 2,231 was reached in the acreage of seed harrowed in (i.e. planted) for farmers. This additional service, for which a charge of 10s. per acre is made, is requested by an increasing number of farmers each year.

189. The co-operative societies at Torma Bum and Yawbeko cultivated 1,336 acres with Ferguson tractors and implements. The total acreage allocated to farmers in the District in 1958 was therefore 5,522 acres.

190. The ploughing season did not get properly under way until the end of February as the grassfields dried out late and ploughing was difficult. Work in the Gbap area was done by eight old type Fordson Majors. Four Fowlers were received from Makeni to augment the tractor force. Heavy rain was experienced in June and farmers who planted late were handicapped by flooding of portions of their plots but as July was remarkably dry farmers were able to complete planting.

191. Beetle damage was seen on young rice plants at Gbeha and Bo sites. Specimens were collected and subsequently identified at the British Museum as a new species and named *Heteronychus oryzae* Britton. This beetle has been reported as damaging rice on the Bonthe grasslands on several previous occasions as far back as the 1920's, but is rarely serious.

192. *Piassava*—Samples of piassava produced by quick boiling methods similar to those now practised by some farmers in areas where an ample supply of firewood is available, were sent for examination by the Tropical Products Institute. The reports received indicate that high quality piassava can be produced by boiling, and by a combination of boiling and a short period of retting.

193. *District Council*—One Agricultural Instructor was assigned to the Bonthe District Council throughout the year. He was responsible for the mangrove clearing team, the oil palm plantation at Gambia and piassava advisory work.

NORTHERN CIRCLE (BOMBALI—TONKOLILI)

194. *General*—Work within the circle continued to be principally concerned with advisory and extension services to farmers, and the development of mechanised rice cultivation on the bolilands. The agricultural activities of Bombali and Tonkolili District Councils, with which the Department is concerned in an advisory role, were again curtailed for financial reasons.

195. *Inland Swamp Development*—The development of hitherto uncultivated swamps continues, in the absence of the original bonus schemes, in a most encouraging fashion.

196. *Ox-Ploughing*—Other interests have reduced the number of ploughs and oxen to those owned by a hard core of enthusiasts. 60 cwts. of super-phosphate were sold to farmers and the consequent rice yields have been very good indeed. There are signs that this is stimulating a revival of interest in the scheme. 22 bulls were castrated for the farmers with the co-operation of the Veterinary Department during the year.

197. *Mechanical Cultivation*—Expansion of mechanical cultivation in the bolilands has been halted, pending the results of investigations now started as to yield improvement. As in all other areas farmers paid 10s. an acre in advance for ploughing done this year, the first stage towards full payment in advance. This should lead to a greater attitude of responsibility in the farmers approach to the scheme. The experimental programme in progress at Kon-to-be and the soil survey of the bolilands should help to resolve the special problems of these otherwise potentially valuable areas. Details of these are given later in this report.

198. New sites were opened in Makari-Gbanti Chieftdom during the year facilitated by the use of the new Batkanu-Marenka District Council road, suitable at present only as a dry season thoroughfare. Ploughing was again undertaken at Mateboi, but Batkanu, Mayoso, Massang and Kumrabai were all closed because of the poor repayments position; court proceedings were instituted in a number of cases but failed to produce any overall response.

199. The following table of acreage ploughed shows the progress of the scheme since its inception:—

<i>District</i>		1952	1953	1954	1955	1956	1957	1958
Bombali	..	238	607	1,600	1,373	192	640.5	940
Tonkolili	..	—	308	849	2,227.75	2,627.5	1,984.5	574
		238	915	2,449	3,600.75	2,819.5	2,625	1,514

200. The Malanema Kuru Rice Producing Society, continued to operate in the Masimo-Kumrabai area and cultivated approximately, 1,300 acres. The overall figure for the two districts was therefore about 2,800 acres.

201. The sale of superphosphate continued on an encouraging scale; 2 cwts. per acre is the dressing recommended, but the overall farmer average is only gradually improving towards this level and in spite of advice to the contrary most farmers continue to apply it as a top-dressing 3-6 weeks after sowing; the recommended time of application is with the seed.

202. *Oil Palms and Coffee*—Distribution of seedlings of both these crops was carried out by the Bombali and Tonkolili District Councils, with the scale of distribution increased, and the importance of successful establishment continuing to be emphasised.

NORTH-EASTERN CIRCLE (KONINADUGU)

203. *Cattle Owner Settlement Scheme*—The objectives of the scheme have been stated in previous reports; briefly they are to settle nomadic cattle owners and thereby prevent overstocking and erosion, and to encourage crop cultivation and better land use.

204. During 1958 a further sixty-one settlements were surveyed and demarcated. Twenty-three of these were in Sulima and thirty-eight in Mongo chiefdoms. Fourteen of these new settlements were not registered and await the clarification of boundary disputes.

205. The overall position is shown in the following table:—

Chiefdom			Settlements Surveyed	Settlements Registered	Settlements Occupied
Musaia	..	..	17	17	14
Sulima	..	..	69	69	50
Mongo	..	..	38	24	22
			124	110	86

206. It should be noted that the settlements in Mongo Chiefdom are the first to be established in Kuranko territory; all previous settlements have been within Yalunka territory.

207. Modifications, mentioned in last year's report, were made to the Tribal Authorities Orders under which the scheme is sanctioned by the Tribal Authorities. Provision was made for "farming areas." Four such areas in Sulima and six in Mongo Chiefdom were demarcated and registered.

208. Quarantine restrictions again caused difficulties in control of grazing and eviction of unauthorized cattle from the Settlements. A Cattle Owners Co-operative for marketing was started at the end of the year. It is hoped that this will be successful as it would be most beneficial to the scheme.

209. The construction of three bridges and two and a-half miles of access road was completed.

210. *Mechanical Cultivation*—Ploughing for farmers was carried out in Musaia, Sulima and Mongo chiefdoms as tabulated below; a greater acreage was requested by farmers but could not be satisfied owing to the lack of spares for two of the tractors.

				Ploughed acres	Harrowed acres
Musaia	..	..	..	53.4	6.00
Sulima	..	..	..	145.05	69.30
Mongo	..	..	..	16.80	6.00
				215.25	81.30

211. *District Council Work*—The District Council farm was closed down as its major function has been superseded by the Horticultural Station at Kabala. Work was confined to the supervision of Native Administration nurseries and distribution of planting materials including oil palm and coffee seedlings to farmers.

COLONY CIRCLE (NEWTON)

212. *Rice Swamp Development*—Nurseries did well but the dry spell at the time of transplanting caused the death of some seedlings and below average yields. Farmers who planted late had satisfactory crops as the rains continued well into November. There was a slight fall to $87\frac{1}{2}$ acres in the acreage rented and cultivated at Maswari. The acreage ploughed for farmers was increased to 22 acres at Maswari and 12.6 acres at Fogbo. The four acre polder planted by the Department with Sughandi variety yielded 3,912 lb. of husk rice i.e. 978 lb. per acre. Superphosphate at 2 cwt. per acre was applied before transplanting but tillering was poor due to the dry spell. Very little interest was shown at Kotopema and Campbell Town. Some planting of rice was done at Songo Creek but most of the farmers who received loans for this clearance project are waiting for the swamp to become sufficiently "weathered" before planting; repayment of loans continued.

213. All available land at Wellington polder was allocated by the Village Area Committee, which now organises this project, and farmers had satisfactory crops. Repairs to the bund are now necessary; and are the responsibility of the village committee who are arranging for this work to be carried out.

214. *Oil Palm and Coffee Distribution*—2,140 oil palm seedlings were distributed free of charge to farmers who had cleared the land and dug holes at the correct planting distance. Eight farmers were given 1,090 wire collars provided by the Produce Marketing Board to protect their seedlings against rodent damage. By use of these and better maintenance farmers should be able to improve survival rates which have been low in the past. A charge was made for coffee seedlings as Rural Area Council funds for free provision of seedlings were exhausted. The number sold was small as the area is not suitable for this crop except on a small scale.

215. *Local Stock Keeping*—Local pig keepers made steady progress during the year and were relatively free from disease troubles. Two farmers have over 100 pigs and they sell their pork to the large firms with cold storage facilities in Freetown. The smaller producers expanded a little and sold their pork in the local markets. During the last two months of the year demand for pork fell and farmers had difficulty in selling their pork to the firms, because of imports.

216. The growing interest in poultry keeping referred to in last year's report continued and despite the incubators working to full capacity there was a long waiting list for the supply of chicks at day old and eight weeks old. This is a direct result of farmers studying the successful methods adopted at Newton. There are now five farmers with over 500 birds each and the industry is developing rapidly to meet the ready market in all the larger towns of the country.

217. *Waterloo Oil Palm Plantation*—A further 200 acres were planted during 1958 bringing the total area planted since 1950 to 1,012 acres. This virtually completes planting. A Ferguson 35 tractor, a trailer and a Caldwell bush hog were obtained during the year. Ninety acres were stumped and maintained mechanically and another twenty-three acres were brushed mechanically without stumping. The weight of fruit bunches harvested

was 54,218 lb. compared to 35,135 lb. in 1957. Palms planted in 1955 came into bearing at the end of the year. Intercropping by local farmers has been encouraged in the past when the palms were small. This will cease in 1959 as the cassava hills hinder mechanical brushing. Small fertilizer trials again illustrated that the palms are short of nitrogen and magnesium in the first two years after planting but subsequently leaf deficiency symptoms disappear and the palms make good growth.

F—RESEARCH

Plant Pathology Section:

218. The Plant Pathologist was absent on leave from 20th January to 14th April, 1958.

219. *Collections*—The collecting of phanerogamic and mycological specimens was limited as more time was devoted to the Black Pod spraying trials on cocoa and investigation of the "virus disease" outbreak. In the absence of a Systematic Botanist and Ecologist, maintenance of the phanerogamic herbarium was again supervised by the Plant Pathologist during the year.

220. *Virus Disease of Cocoa*—An outbreak of virus disease akin to "Swollen Shoot" disease of cocoa was discovered on a farm at Gandorhun in Kenema District by a member of the staff of the West African Cocoa Research Institute. This is the first record of such a disease in Sierra Leone.

221. The symptoms of the disease were mainly confined to the leaves although small swellings on branchlets were observed during the course of a series of observations undertaken subsequently. The leaf symptoms can be classified as follows:—

- (i) clearing of the smallest veins only;
- (ii) clearing of small veins and slight loss in chlorophyll in the adjacent mesophyll tissue; one leaf slightly curved;
- (iii) scattered translucent pin points.

The number of infected leaves per tree varied from 50 per cent of the foliage to a stage where it was difficult to observe a single infected leaf on a tree.

222. A total of 37 infected trees were recorded but the effect of the disease on these was not severe as subsequently a heavy crop of pods was harvested.

223. The origin of the outbreak is obscure, but it is suspected that a large *Ceiba pentandra* tree at the edge of the farm may be an alternate host of the virus. Further, none of the common insect vectors (e.g., *Pseudococcus* spp.) could be found, and the nearest neighbouring cocoa farm, a quarter of a mile away, was free from the disease.

224. Graft and bud transmissions of this "Gandorhun" virus were carried out on cocoa seedlings at Njala. Only two out of the nine treated seedlings showed clearing of the angular tissue between the small veins. Since these experimental symptoms were unlike those observed on the infected leaves at Gandorhun, a second series of transmission trials was carried out, using seedlings grown in sand, and balanced nutrient solutions. There were no symptoms visible on the leaves by the end of the year.

225. A second outbreak of virus disease on cocoa was discovered in November, in a farm at Giehun (Lower Bambara). This appears to be a different strain from the Gandorhun virus.

226. The symptoms were irregular with chlorotic blotches scattered over the entire lamina. Adjacent blotches tend to unite, thereby reducing the functional area of the leaf. The smallest veins in the affected patches were purplish red on the under surface.

227. Transmissions of the "Giehun" virus to cocoa seedlings were carried out at Njala in November but experimental symptoms were not expected to appear before the end of the year.

228. *Black Pod Disease of Cocoa—Phytophthora palmivora* Butler—It is apparent that Black Pod disease is not severe in all farms in the South-east and South-western Circles where cocoa is grown, but is only serious in isolated farms. Black Pod incidence was reported to be high in the Gaura and Mandu chiefdoms. The highest incidence being recorded at Goo (Mandu) where 50 per cent of the trees in a 2-acre farm had an average of 8 black pods per tree. This is a considerably greater incidence than any detected in 1957.

229. Experimental spraying to control Black Pod was continued at Kpuabu (Gaura) during the season May–November. In addition spraying trials were carried out at Kpai (Small Bo) and Neikabo (Nongowa). The treatments at Kpuabu were:—

- (i) underbrushing and 1.0 per cent Carbide Bordeaux applied to developing pods at 1, 2, 3, and 4-weekly intervals;
- (ii) underbrushing and 0.4 per cent 'Perepod' applied at fortnightly intervals;
- (iii) underbrushing and 0.4 per cent 'Kopapod' applied at fortnightly intervals;
- (iv) underbrushing and 1.0 per cent Carbide Bordeaux applied at fortnightly intervals;
- (v) *Sanitation*—underbrushing alone with periodic removal of diseased pods;
- (vi) control (untreated).

230. The results indicate that spraying with any of the fungicides tested protected pods from Black Pod disease, but that 1.0 per cent Carbide Bordeaux was superior to both 0.4 per cent 'Perepod', and 0.4 per cent 'Kopapod.' There seems to be very little difference in the level of Black Pod incidence between the control plots (no treatment) and the sanitation treatment, where diseased pods were removed periodically.

231. At Kpai and Neikabo, 1 per cent Carbide Bordeaux was applied to pods at fortnightly intervals, but owing to the low incidence of the disease, the trials were discontinued in August.

232. The results of the trials at Kpuabu, Kpai and Neikabo, are set out in Tables I to III in Appendix IV.

233. *Rice Disease*—There was an outbreak of 'False Smut' (*Ustilago inoidea* virens (Cke.) Tak.) on upland rice at Bo site (Kpanda-Kemo Chiefdom).
Systematic Botany Section:

234. No Botanist was in post during the year, and the Plant Pathologist continued to maintain general supervision of the herbarium.

Entomology Section:

235. The post of Entomologist remained vacant during the year.

236. *Coconut Beetle*—There were no recurrences of attacks by the pest *Oryctes owariensis* and its allies.

237. *Locusts*—Two small swarms of desert locusts crossed the northern border of the territory in January, but returned to Guinea almost immediately. No damage was caused.

Agricultural Chemistry Section:—

238. The Agricultural Chemist went on vacation leave on 25th October, 1958. The post of second Chemist remained vacant.

239. *Surveys*—Extensive preliminary surveys for sites suitable for development of rubber and oil palm plantations were carried out. These were followed by visits to selected sites by representatives of Unilever and C.D.C.

240. *Laboratory Investigations*—Analyses of feeding stuffs were continued and the list of feeding values of local products was extended. Routine analysis of grasses from Musaia was commenced and the nutrient content of thirteen species was determined. Analyses to investigate the nutrient status and nitrogen relations of boliland soil at Kontobe were continued. Soil samples were collected on four dates from eight sites, two on uncultivated land and six on cultivated land. The results of the analyses are given in Appendix III. Total nitrogen was found to increase between early May and September. The content of nitrogen as the ammonium ion diminished markedly during the same period. The higher level on the cultivated plots Nos. 4 and 5 in June reflects the application of sulphate of ammonia fertiliser but no sign of this remained by early August. The content of nitrogen as nitrate was much lower. On the uncultivated land the content increased in the topsoil but on the cultivated plots decreased after flooding in August. Sulphate of ammonia had little effect on the nitrate status of plots 4 and 5.

241. *Pot Experiments*—The trials described in the 1957 Report were concluded. There was no change in deficiencies indicated in the Kontobe boli soils. In a sand culture experiment using "Long Ashton" solutions of nutrients only magnesium and nitrogen deficiencies were shown with certainty. A further pot trial with Kontobe soil was carried out to try to determine the cause of yellowing of rice in the field. All combinations of the major nutrients were supplied including sulphate. In all cases the symptoms of yellowing occurred although maximum growth was obtained using all the major elements. The addition of sulphate modified the symptoms.

242. *Field Experiments with Swamp Rice, Kontobe*—As in previous years the Chemist continued to be closely concerned with the experimental programme at Kontobe. Basic cultivations were disc ploughing and disc harrowing, the seed was combine drilled and harvesting was by means of a Massey Harris self-propelled, 80 Special rice combine. Planting was done in the first two weeks of May. Rainfall in March, April and May was 8.09 inches, 8.91 inches and 12.76 inches, respectively. The moisture content of the soil in mid-May had reached 16 per cent compared to 5 per cent in March. Ground conditions were exceptionally wet whereas in 1957 planting was done in unpleasant dusty conditions. Observations of interest were that the Ferguson 35 tractor with mounted implements was able to work at all times; a wheeled Fordson Major was efficient on dry conditions but suffered excessive wheel spin when towing a trailed harrow when the ground was damp; Fowler tractors were able to operate on damp ground but the Countess harrows could not be used in damp conditions; the Massey Harris seed drill could only be used when the ground was dry.

243. *Experiment 1/58—Cultivations and Fertiliser Trial*—The 1957 experiment was repeated with the sub-plots split to compare the residual effects of the 1957 fertiliser dressing against the yield from fertilisers two years in succession. Weed growth in some plots was heavy. However results confirmed 1957 findings that superphosphate drilled at 1 cwt. per acre is essential. The residual effect of 1957 fertiliser applications gave only small responses.

244. *Experiment 2/58—Variety Trial*—The same layout as in 1956 and 1957 was used but the twelve varieties were re-randomised within the blocks. The variety Parn gave the highest yield, 1,021 lb. of paddy per acre followed by Faya 764 lb. per acre and Pindosein 706 lb. per acre.

245. *Experiment 3/58—Effect of Differing Depths of Water*—The trial consisted of two plots only each of 6.16 acres. One was cultivated and planted normally, the other was formed into cambered beds, the furrows being one foot below normal ground level and the ridges one foot above normal ground level with the ridges eight yards apart. The top of the cambered beds was harvested separately from the sides and furrows. The control plot yielded 1,111 lb. paddy per acre, the tops of the cambered beds at 922 lb. per acre and the furrows and sides of the beds 775 lb. per acre.

246. *Experiment 4/58—Time of Cultivation*—The object of this trial was to compare the effect of date of cultivation on yields and weed growth over a series of years. The experiment is to be repeated in 1959.

247. *Experiment 5/58—Annual Variations in Yield*—The two cultivated plots, one receiving no fertiliser and the other 2 cwt. per acre of superphosphate, yielded this year 206 lb. of paddy per acre and 1.122 lb. per acre respectively.

248. *Experiment 6/58—Variety Observation Trial*—An observation trial was carried out with the fifteen recently introduced varieties.

249. *Experiment 7/58—Fertiliser Observation Trial*—The purpose of this trial was to determine whether any of the more uncommon fertilisers would have any effect on the yield of rice. The yield from the plot treated with 1 cwt. superphosphate and 2 cwt. dolomitic limestone was outstanding and investigations will be continued.

Soil Survey Section:

250. The survey of the northern flood plains or “bolilands” under the Colonial Development and Welfare Scheme (D. 3094) commenced in May 1957 and the results of that year’s work were given in the 1957 Report. Owing to the tragic death of the Soil Surveyor, work ceased early in January, 1958. The Agricultural Chemist, prepared a soils map of Kontobe boli from the late Mr. Chisnall’s reports.

251. A new surveyor was appointed but he did not arrive until the end of November and field work recommenced at the end of December.

252. An area of nearly 1,000 square miles was selected for comprehensive examination of both upland and flood-plain soils. This extended from north of Batkanu to south of the Rokel River and from the Katikant hills in the West nearly to Makeni in the East. Within this area several individual bolis were selected for detailed examination. The field work of this survey should be completed by July, 1960.

G—NJALA TRAINING COLLEGE

253. *Agricultural Courses*—The structure of the course remained unchanged. Students are prepared for entry into the Agricultural Instructor cadre of the Department’s Field Staff; they undergo one year of pre-entry field training under the supervision of Agricultural Officers and three years of College courses combining practical and classroom studies. Following the recommendation of the Gorsuch Commission, the status of students was changed. They are now called Agricultural Instructors-in-Training receiving emoluments on Scale H 1.

254. Sixteen students were recruited for the first year's field training, twelve of whom were accepted and will enter the College in 1959. The class of the first College year was composed of twenty students (including one from the Gambia and two being trained on behalf of the West African Institute for Oil Palm Research). Fourteen of these students will proceed to the class of the second College year in 1959. Of the fourteen final year students, two resigned and two failed the final examinations. Two Gambian and two West African Institute for Oil Palm Research students were included among this group; the others will be posted to Agricultural Stations early in 1959.

255. The course syllabus remained unchanged except for the introduction of "Farm Walks." A feature of these regular visits to local farmers is the opportunity afforded students for constructive criticism and discussion and development of initiative.

256. The practical work on the College farm continued to be done by the students on established lines. Farm work provides the students with practical experience to supplement the theoretical knowledge of the lectures and this is especially valuable when operations such as multiple-stem pruning of coffee are carried out by the students themselves.

257. The Livestock section continued to flourish: pigs, rabbits and a flock of Light Sussex fowls were maintained. Students continued to have opportunities to operate the range of machinery used on the College farm, including light tractors.

258. Final year students visited the Colony and the Northern Province visiting Newton, Rokupr, Batkanu, Makeni, Musaia, Gberia and Kontobe to see the various Agricultural activities at these stations.

APPENDIX I—EXPORTS OF PRINCIPAL AGRICULTURAL PRODUCTS

		1938				1955				1956				1957				1958			
		Ton	Value (£)	Value (ton)	Ton	Value (£)	Value (ton)	Ton	Value (£)	Ton	Value (£)	Value (ton)	Ton	Value (£)	Value (ton)	Ton	Value (£)	Value (ton)	Ton	Value (£)	Value (ton)
Bananas ..	..	1	2	—	292	7,624	26	16	333	21	407	24	19	431	22½	17	407	24	19	431	22½
Beeswax ..	..	—	—	—	19	8,889	468	11	6,074	528	1,236	494	5	2,153	430	2½	1,236	494	5	2,153	430
Benniseed ..	..	374	3,700	10	111	8,848	79	12	761	63	—	—	—	—	—	—	20	—	—	—	—
Calabar Beans ..	..	—	—	—	47	9,143	194	125	31,797	254	22,095	246	90	385,946	192	90	22,095	246	58	10,418	180
Cocoa ..	..	384	5,849	15	2,177	740,829	340	2,881	581,305	201	2,011	392	21	895,687	238	2,011	385,946	192	2,828	872,290	309
Coconuts (fresh) ..	..	n.a.	44	—	25	680	27	24	1,013	42	19	11½	11½	298	26	19	392	21	11½	298	26
Coffee ..	..	38	793	21	2,092	473,983	226	3,009	660,875	219	3,758	895,687	238	3,348	895,055	3,758	895,687	238	3,348	895,055	267
Ginger ..	..	2,705	60,680	22	1,733	357,320	206	1,117	241,269	216	700	99,880	143	789	70,050	700	99,880	143	789	70,050	89
Groundnuts ..	..	n.a.	5	—	—	2	—	—	2	—	—	—	—	—	—	—	2	—	—	—	—
Kola nuts ..	..	1,450	29,785	20	1,127	212,095	188	828	106,840	129	736	102,942	140	1,035	135,227	736	102,942	140	1,035	135,227	131
Palm Kernels ..	..	63,697	457,031	7	57,640	2,509,537	43	57,645	2,507,839	43	52,967	2,253,357	43	54,609	2,448,256	52,967	2,253,357	43	54,609	2,448,256	47
Palm Oil ..	..	1,006	16,025	15	15	2,252	150	13	1,464	113	11	1,233	112	10	1,077	11	1,233	112	10	1,077	108
Pepper (Dried Red) ..	..	90	3,410	38	14	2,653	190	2	324	160	1½	217	160	3	275	1½	217	160	3	275	366
Piassava (Prime Sherbro) ..	..	—	—	—	—	—	—	611	47,284	77	708	47,954	68	789	43,176	708	47,954	68	789	43,176	55
Piassava (Sulima) ..	..	3,751	40,369	10	4,344	215,179	49	4,633	262,111	56	3,641	199,982	55	4,155	194,303	4,633	262,111	56	4,155	194,303	47
Total Value all main Agricultural exports	..	—	617,693	—	—	4,588,223	—	—	4,449,341	—	—	4,011,335	—	—	4,673,009	—	4,449,341	—	—	4,673,009	—
Total Tonnage all main Agricultural exports ..	..	73,556	—	—	70,218	—	—	70,927	—	—	64,662	—	—	67,657	—	—	64,662	—	—	67,657	—

APPENDIX II—RAINFALL 1958

Station	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Average 10 years
Musaia	1.58	0.09	2.12	4.77	7.07	6.06	8.18	10.2	17.10	13.88	9.39	Nil	81.25	80.01 (7)
Makeni	0.39	Nil	6.32	8.66	7.55	12.69	9.11	18.34	24.24	18.62	11.12	0.14	117.18	119.30
Kontobe	Nil	Nil	8.09	8.91	12.76	10.47	11.73	14.18	18.22	17.18	12.87	2.94	117.35	—
Katonga	0.20	0.22	2.32	3.86	11.54	12.19	13.95	18.25	13.97	13.27	13.67	1.93	105.37	—
Batkanu	0.18	0.83	2.97	6.70	9.92	9.30	9.65	10.84	14.56	19.67	13.89	0.54	99.05	107.10
Rokupr	0.07	0.02	0.27	5.60	10.93	15.44	12.20	18.39	24.48	16.02	16.93	2.12	122.61	115.32
Lungi	0.21	0.16	3.74	2.94	7.22	17.82	18.50	16.85	26.48	9.22	12.08	1.98	119.06	132.76
Newton	2.22	0.05	3.41	6.75	9.93	15.78	19.52	13.11	17.64	8.93	11.88	2.41	111.63	128.38
Waterloo	Nil	Nil	3.24	6.70	10.05	16.01	16.20	25.78	14.79	8.96	10.51	1.01	113.25	—
Hill Station	2.78	4.05	1.84	3.44	10.73	46.20	41.84	19.80	36.20	11.95	11.87	1.84	192.54	173.81
Lumley	1.71	2.55	1.60	4.44	13.98	35.33	41.37	17.97	27.13	12.32	11.51	2.42	172.33	—
Njala	0.56	0.55	5.46	6.77	10.88	20.23	7.0	7.79	21.15	14.57	9.77	2.16	106.89	109.79
Bo	0.90	0.60	4.61	8.16	13.47	19.94	5.70	9.07	20.09	17.60	7.44	2.50	110.08	117.29
Bonthé	2.26	0.09	5.41	5.78	12.21	34.35	12.43	14.00	18.09	9.15	8.21	3.68	126.47	144.23
Solon	5.13	0.55	2.80	9.58	17.91	37.03	7.26	11.78	25.67	12.49	14.24	1.63	146.07	—
Torma	2.68	3.11	6.29	4.96	11.89	19.29	6.94	14.34	24.55	9.17	15.22	0.39	118.83	—
Kenema Farm	Nil	0.41	7.31	8.79	8.24	7.22	7.54	8.57	10.75	17.92	9.70	3.13	89.58	112.69 (7)
Kailahun	1.30	0.85	4.95	7.09	9.65	10.80	9.94	6.49	17.22	10.53	10.05	1.56	90.13	110.32
Yengema	1.84	1.02	5.96	5.90	8.28	14.25	18.57	6.75	16.39	12.68	14.79	2.20	108.63	132.76

APPENDIX III

RESULTS OF TRIALS AND EXPERIMENTS, NJALA

I. *Groundnuts*—(a) *Variety Trial*—Six varieties of groundnuts, including one variety—Mwitunde—*ex* Nigeria, and the remainder local varieties were grown on ridges on Blocks 34 and 35. They were sown six inches apart on the ridges which were nine inches apart; no fertiliser was applied. The results of the trial are shown below:—

<i>Variety</i>	<i>Acreage</i>	<i>Yield in lb./acre Uncorticated</i>
Mwitunde	0.014	926
Kono	0.184	489
Maris	0.184	468
Sotina	0.184	572
Lakansina	0.184	22
Wilbekana	0.184	136

It appears from the results of the above trial that the Nigerian variety Mwitunde is capable of out yielding both Kono and Maris which are the two varieties most commonly grown in Sierra Leone.

It is planned that the trial will be repeated next year and that percentage germination counts will be made, as it is thought that the low yields of both Kono and Maris were largely due to the poorer germination of the seed of these two varieties.

(b) *Exhaustion trial*—This trial on block 15 was summarised in the 1957 Report. In 1958 the half of the block which had been dressed with fertiliser in 1957 was not treated; the other half was divided into two quarter-acre sections one of which was dressed with:—

Dolomitic limestone	20 cwt./per acre
Superphosphate	2 cwt. „ „
Potassium sulphate	2 cwt. „ „

Results 1958:—

<i>Treatment</i>	<i>Yield in lb./ acre</i>	<i>Yield of green matter/lb.</i>
Fertilised 1957; Not Fertilised 1958	1,224	1,752
Not Fertilised 1957; Fertilised 1958	300	1,196
Not Fertilised 1957 or 1958 ..	112	408

Little information can be gained from the 1958 results of the above trial. The very low yield of 300 lb. even with fertilisers, was due to a combination of poor germination of the seed and a high incidence of blind seed.

II. *Yams*—The variety trial was continued; results were:—

<i>Years</i>	<i>1954</i>	<i>1955</i>	<i>1956</i>	<i>1957</i>	<i>1958</i>	
Yellow Yams ..	2,259	10,224	7,267	12,442	18,423	
White Yams ..	1,452	971	2,827	1,803	1,841	
Water Yams ..	Not grown		7,350	11,613	21,100	Yields in lb.
Chinese Yams ..	do.	not grown		9,880	2,360	acre

The Yellow Yams, White Yams and Water Yams received a dressing of approximately 1 ton of compost per acre and 5 cwt. of superphosphate; the Chinese Yams received no dressing of either compost or superphosphate, none being then available.

III. *Continuous Cultivation of Annual Crops*—The method of mixed cropping established in 1952 continued. The block was ploughed and ridged using the Ferguson tractor on 14th March, yams and cassava were planted on the 20th March and rice was planted in the furrows on the 9th May. Yields were poor and reflect the exhausted condition of the soil and the lack of adequate rainfall during July–September. The rice crop was eaten by birds.

Year			<i>Husk rice</i> <i>lb.</i>	<i>Cassava</i> <i>lb.</i>	<i>Yams</i> <i>lb.</i>	<i>Musaia</i> <i>Cowpea</i> <i>lb.</i>	<i>Men fed theoret- ically per year per acre (based on calorific value)</i>
1952	..	..	135 (Flagoi)	7,553	1,238	10	4.50
1953	..	..	120 (Flagoi)	5,033	3,346	—	3.96
1954	..	..	497 (Glaberrima)	3,235	1,306	56	2.75
1955	..	..	483 ,,	2,826	81	6	2.77
1956	..	..	2.6 ,,	3,137	1,252	—	2.58
1957	..	..	136 ,,	1,438	844	—	1.00
1958	..	..	Nil	2,403	474	Nil	1.00

IV. *Permanent Crops*—Yield recording of citrus, coffee and pineapples continued.

APPENDIX III—*contd.*—NITROGEN VARIATIONS IN KONTOTBE BOLI SOILS

Sampling Site	TOTAL N %				AMMONIUM—N. ppm				NITRATE—N ppm			
	Early May	Mid June	Early Aug.	Late Sept.	Early May	Mid June	Early Aug.	Late Sept.	Early May	Mid June	Early Aug.	Late Sept.
Uncultivated 1. Top Soil ..	..	0.088	0.150	0.183	0.180	14.1	9.2	4.3	9.0	0.6	0.8	1.7
Bleached Layer	..	0.120	0.094	0.051	0.150?	16.0	11.6	5.3	9.0	2.6	3.5	0.5
Mottled Layer	..	0.095	0.080	0.039	14.2	12.5	12.5	11.6	2.4	3.3	7.0	1.5
Uncultivated 2. Top Soil ..	..	0.122	0.170	0.177	8.3	7.0	4.3	4.3	1.0	0.9	2.3	..
Sub Soil	..	0.067	0.102	0.114	12.5	8.1	8.7	8.7	1.1	1.3	2.2	..
Cultivated 3. Yellow ..	..	0.079	0.074	0.110	9.7	12.7	5.8	5.8	1.7	4.6	0.6	..
4. Green ..	..	0.078	0.090	0.092	13.2	20.1	6.0	6.0	1.9	7.4	0.6	..
5. Red ..	..	0.059	0.072	0.107	9.3	14.4	4.8	4.8	3.3	6.1	0.6	..
6. White ..	..	0.060	0.120	0.119	9.9	11.7	6.7	6.7	1.5	4.5	0.8	..
7. Blue ..	..	0.062	0.132	0.147	9.1	12.0	6.4	6.4	1.9	7.0	0.8	..
8. Black ..	..	0.079	0.108	0.121	7.0	10.2	3.7	3.7	1.2	1.9	1.8	..

APPENDIX IV

RESULTS OF SPRAYING AND SANITATION (INCLUDING PERIODIC REMOVAL OF DISEASED PODS) IN PRIVATE FARM AT KPUABU (GUARA) FOR THE SEASON MAY-NOVEMBER, 1958

TABLE I
1958

TABLE I 1958	TRIAL I <i>Pods sprayed with 1 % Carbide Bordeaux at intervals of 1, 2, 3 and 4 weeks</i>					TRIAL II <i>Effect of 0.4 % Perepod compared with 1 % Carbide Bordeaux; pods sprayed fortnightly</i>			TRIAL III <i>Effect of 0.4 % Kopa-pod compared with Carbide Bordeaux; pods sprayed fortnightly</i>		TRIAL IV <i>No treatment compared with removal of diseased pods</i>		
	<i>Control unsprayed</i>	1	2	3	4 wks. unsprayed	<i>Control</i>	<i>Père pod</i>	<i>C/Bor-deaux</i>	<i>Control</i>	<i>Kopa-pod</i>	<i>C/Bor-deaux</i>	<i>Control</i>	<i>Sanitation</i>
(i) Black Pods (%)	..	26.61	0.1	Nil	0.25	Nil	23.56	Nil	10.56	Nil	Nil	29.98	24.75
(ii) Ripe Pods (%)	..	73.39	99.9	100.0	99.75	100	76.44	100.0	100.0	100.0	100.0	70.02	75.25
(iii) Total pods (actual Black & Ripe pods)	1071	999	830	807	814	505	778	931	644	375	586	794	408

N.B.—(a) Black and Ripe pods (i) and (ii) expressed separately as percentages of Total pods (iii).

(b) Plots: Each plot contained 6 trees producing a minimum of 12 pods per tree.

(c) Replications: There were 6 replications of each treatment (i.e. total of 36 trees allocated to each treatment or 180 trees to Trial I; 108 trees to Trial II, 108 trees to Trial III and 72 trees to Trial IV).

RESULTS OF SPRAYING AT KPAI (Small Bo.) AND NEIKABO
(NONGOWA), MAY—AUGUST, 1958

TABLE II: KPAI: Spraying May–August, 1958

<i>Pods</i>				<i>Control Unsprayed</i>	<i>1.0% Carbide Bor- deaux applied fort- nightly</i>
Black Pods %	..	..	..	1.1	0.07
Ripe Pods %	..	..	..	99.9	99.93
Total Pods (Black & Ripe)	..	..	..	4,827	5,710
These plots consisted of:—					
				<i>Area (Acres)</i>	<i>Trees</i>
Control Plots	..	..	..	0.75	280
Sprayed Plots	..	..	..	0.89	341

TABLE III: NEIKABO:—Spraying June–August, 1958

<i>Pods</i>				<i>Control Unsprayed</i>	<i>1.0% Carbide Bor- deaux applied fort- nightly</i>
Black Pods	..	..	..	0.41 %	0.04
Ripe Pods	..	..	..	99.59	99.96
Total Pods (Black & Ripe)	..	..	..	6,208	5,713
These plots consisted of:—					
				<i>Area (Acres)</i>	<i>Trees</i>
Control Plot	..	..	..	1.0	519
Sprayed Plot	..	..	..	1.0	548

Black and Ripe expressed separately as percentages of total pods in Tables II & III

APPENDIX V

SIERRA LEONE WEIGHTS AND MEASURES

The sale of local produce in native markets is almost invariably done by volume. Standard containers which can be readily obtained are used, the commonest being the cigarette tin (cup) and the beer bottle. Larger measures are the four-gallon kerosene tin, and the kerosene case, which held two tins. These are no longer readily available since fuel is now principally supplied in 44-gallon drums or in bulk.

Certain measures became standardised by usage for the major agricultural commodities. The average weight of a kerosene case, heaped up until no more stayed on, was taken as the basis for the “bushel” weight. The Sierra Leone “bushel” is, therefore, considerably greater than the Imperial bushel. It does not even refer strictly to the older “Colonial” bushel used up to 1900, but to the weights of the lots in which commodities are traditionally traded.

The following tables contain most of the Sierra Leone measures.

Basic Measures of Volume

4 cigarette cups	..	..	..	..	1 penny pan
2 penny pans	..	..	..	..	1 threepence pan
5 threepence pans	..	..	..	..	1 kettle (21 lb. clean rice)
2 kettles	..	..	..	..	1 can or tin
2 cans or tins	..	..	..	..	1 “bushel” (84 lb. clean rice)

Standard nett weights per bag

cocoa	..	..	..	..	140 lb.
coffee	..	..	..	..	132 lb.
ginger	..	..	..	..	212–235 lb.
groundnuts (undecorticated)	..	..	..	..	77 lb.
palm kernels	..	..	..	..	182½ lb.
rice (clean)	..	..	..	..	168 lb.
rice (paddy)	..	..	..	..	120 lb. (often 150 lb.)

APPENDIX V—*continued**"Bushel" weights*

benniseed	..	..	..	..	60 lb.
chillies (dried peppers)	..	..	..	..	28 lb.
groundnuts (undecorticated)	..	..	..	..	36 lb.
guinea corn	..	..	..	..	84 lb.
kola nuts ("measure"—8 kettles)	..	..	..	..	176 lb.
maize	..	..	..	..	72 lb.
palm kernels	..	..	..	..	60 lb.
rice (clean)	..	..	..	..	84 lb.
rice (paddy)	..	..	..	..	60 lb.

Miscellaneous Measures

"bundle" of piassava	..	..	..	..	56 lb.
bottle—reputed quart	..	..	..	..	$\frac{1}{4}$ th gallon
bottle—reputed pint	..	..	..	..	$\frac{1}{12}$ th gallon
cigarette cup	..	..	..	..	8 to $9\frac{1}{2}$ oz. of rice
kettle (clean rice)	..	..	..	..	21 lb. (2 gallons approx.)
tin (or can):—	..	..	..	..	4 gallons
of honey	..	..	..	..	48 lb.
of palm oil	..	..	..	..	38 lb.

*To be purchased from the Government Bookshop, Water Street, Freetown, and from
the Crown Agents for Oversea Governments and Administrations,
4, Millbank, Westminster, London, S.W. 1.*

1960

